

**U.S. Department of the Interior
Bureau of Land Management**

**Draft Environmental Assessment
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ATLANTA MINE PROJECT

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LIST OF APPENDICES**Appendix A:** BLM Interdisciplinary Team Review Record**Appendix B:** Completed BLM Form 8400-4-Visual Contrast Rating Worksheets

1.0 PURPOSE AND NEED

1.1 INTRODUCTION

This environmental assessment (EA) has been prepared to analyze the potential impacts of Meadow Bay Gold Corporation's (Meadow Bay's) proposed exploratory drilling operations at Atlanta Mine, located on public lands managed by the U.S. Department of the Interior, Bureau of Land Management (BLM), Ely District, Schell Field Office (FO). Meadow Bay's exploratory Plan of Operations (2012 PoO), which describes the proposed exploratory drilling activities, was submitted to the BLM in December 2012.

This EA is a site-specific analysis of potential impacts that could result from the implementation of the Proposed Action or its alternatives. The EA assists the BLM in project planning, ensuring compliance with the National Environmental Policy Act (NEPA), and determining whether any "significant" impacts could result from the analyzed actions. ("Significance" is defined by Council on Environmental Quality (CEQ) regulations for implementing NEPA and is found in 40 Code of Federal Regulations [CFR] 1508.27.) An EA provides evidence for determining whether to prepare an environmental impact statement (EIS) or a Finding of No Significant Impact (FONSI). A FONSI is a document that briefly presents the reasons why implementation of the selected alternative would not result in "significant" environmental impacts (effects) beyond those already addressed in the *2008 Ely Resource Management Plan* (RMP) and Record of Decision (ROD) (BLM 2008a), hereafter referred to as the 2008 Ely RMP. If the decision maker determines that this project would have "significant" impacts, then an EIS would be prepared for the project. If not, a ROD may be signed for the EA that approves the alternative selected.

1.2 BACKGROUND

Meadow Bay is proposing an exploratory drilling program to further define the extent and nature of the quality and quantity of minerals within the claim boundaries at Atlanta Mine (project area). Meadow Bay is currently conducting Notice of Intent (Notice)-level exploration activities of 5 acres in the project area. Meadow Bay has prepared the 2012 PoO to expand the work and authorize additional exploratory drilling operations.

The work would be conducted within an 11,365-acre project area, located approximately 17 miles east of U.S. Highway 93, in Sections 12, 13, 24 and 25, Township 7 North, Range 67 East; Sections 1-3, 7-12, 14-23 and 26, Township 7 North, Range 68 East; and Sections 34 and 35, Township 8 North, Range 68 East (Figure 1-1).

Meadow Bay would conduct the following activities: 1) construction of up to 62 drilling pads and reserve pits; and 2) drilling up to 44 reverse circulation (RC) holes and up to 18 core holes (including 2 deep angled holes). Support facilities would include a primary office, crew quarters, a guard shack, a geology laboratory and portable toilets.

1.3 PURPOSE AND NEED FOR ACTION

The BLM's purpose is to provide Meadow Bay with the opportunity to explore their valid existing mining claims on BLM lands. The need for the action is established by the BLM's responsibility under the Mining Law of 1872, Section 302 of the Federal Land Policy and Management Act (FLPMA), and the BLM Surface Management Regulations at 43 CFR 3809. Under these regulations, the BLM is required to review the 2012 PoO to ensure that Meadow Bay's exploratory activities do not cause unnecessary or undue degradation of the public lands and include appropriate reclamation.

1.4 DECISION TO BE MADE

The decision that BLM will make based on the NEPA analysis would be to approve the 2012 PoO with no modifications and authorize the exploratory activities; approve the 2012 PoO with additional mitigation measures to prevent unnecessary or undue degradation of public lands and/or protect sensitive resource values and to provide for reclamation of disturbed areas; or not approve the 2012 PoO if mitigation measures would not prevent unnecessary or undue degradation of public lands.

1.5 BLM RESPONSIBILITIES AND RELATIONSHIP TO PLANNING

The BLM is responsible for the preparation of this EA, which was prepared in conformance with the policy guidance provided in the BLM NEPA Handbook H-1790-1 (BLM, 2008b) and CEQ regulations for implementing NEPA (40 CFR 1500–1508). This EA will assist the BLM in project planning and in determining whether the Proposed Action is consistent with BLM policies. Pursuant to NEPA (40 CFR 1502.13), this EA has been prepared to provide sufficient evidence and analysis for 1) determining whether to prepare a more detailed EIS or 2) issuing a FONSI.

1.6 CONFORMANCE WITH BLM LAND USE PLAN(S)

The Proposed Action and the No Action Alternative described below are in conformance with the 2008 Ely RMP (BLM, 2008a). The Goals and Objectives within the ROD for the RMP for Mineral Extraction are listed on pages 92-103 of the ROD. The goal listed on page 92 states, "Allow development of solid leasable and locatable minerals in a manner to prevent unnecessary or undue degradation" to the public lands. The objective and minerals decision (MIN-14) listed on page 100 states, "Allow locatable mineral development on approximately 9.9 million acres of federal mineral estate, subject to the prevention of unnecessary or undue degradation of the public lands" (BLM, 2008a).

The BLM is responsible for administering access to mineral rights on certain federal lands as authorized by the General Mining Laws. Under the law, qualified prospectors are entitled to reasonable access to mineral deposits on public domain lands that have not been withdrawn from mineral entry. The BLM is also responsible for reviewing surface resources pursuant to the FLPMA (43 United States Code [USC] 1701 *et seq.*) and the attendant regulations for surface management of lands on mining claims under the General Mining Laws (43 CFR 3809). The surface management regulations require the BLM to comply with the NEPA of 1969, as amended (42 USC 4321 *et seq.*), and to ensure that the operator "conduct all operations in a

manner that complies with all pertinent federal and state laws (43 CFR 3809.420) and will not cause undue and unnecessary degradation of the public lands.”

1.7 RELATIONSHIP TO STATUTES, REGULATIONS, OR OTHER PLANS

NEPA is only one of many authorities that contain procedural requirements that pertain to treatment of elements of the environment when the BLM is considering a federal action. The Proposed Action and the No Action Alternative are consistent with federal, state, and local laws, regulations, and plans and programs. Appendix 1 of the BLM NEPA Handbook (2008b) contains a list of many of the supplemental authorities that may apply to BLM actions.

The Proposed Action and the No Action Alternative are consistent with these federal statutes and regulations. The Proposed Action and the No Action Alternative are also consistent with state plans and policies for the management of mineral and water resources, conservation of special status species, and cultural resource protection, as well as with the 2010 Lincoln County Public Lands Policy Plan and the 2007 Lincoln County Land Use Plan Element to the Lincoln County Master Plan.

1.8 IDENTIFICATION OF ISSUES

1.8.1 *Internal Scoping*

A BLM interdisciplinary (ID) team analyzed the potential consequences of the Proposed Action during internal scoping held on September 4, 2012 and January 28, 2013. The interdisciplinary team analysis record checklist is provided in Appendix A. The following resource issues are analyzed and addressed in Chapter 3 of this EA:

- **Soils:** What impacts would surface disturbance associated with drilling and drill pad construction have on soil erosion in the area, particularly during precipitation events?
- **Cultural Resources:** How will the proponent ensure that cultural resources that may be adversely affected by the Proposed Action will be identified and evaluated? How will the proponent ensure avoidance of adverse effects on historic properties (i.e., NRHP eligible cultural resources) during the proposed exploration activities?
- **Paleontological Resources:** What impacts would the surface disturbance associated with drill pad construction and drilling operations have on paleontological resources?
- **Socioeconomics:** What impacts would the project have on employment opportunities or housing availability in the area?
- **Wildlife:** How would the drilling operations and the construction of sumps affect pronghorn, elk, mule deer and guzzler, big-game habitat, and predator, small-mammal, reptile, and avian species? How would the human activity and noise associated with the operation of heavy equipment and vehicles affect these species?
- **Special Status Species:**
 - **Sage grouse** (*Centrocercus urophasianus*): What impacts would the project's proposed access road and associated vehicular traffic have on sage grouse leks in the area? How would project construction, noise, and human activity affect sage grouse and sage grouse habitat?

- **Pygmy Rabbit** (*Brachylagus idahoensis*): What impacts would the surface disturbance associated with drilling, trenching, and road building and the construction of sumps have on pygmy rabbit and pygmy rabbit habitat?
- **Migratory Birds, including raptors**: What impacts would the surface disturbance associated with drilling, and the construction of drill pads and sumps have on migratory birds and migratory bird nests? How would project construction, noise, and human activity affect these species?
- **Ferruginous Hawk** (*Buteo Regalis*): What impacts would the proposed action have on Ferruginous hawk?
- **Tunnel Springs Beardtongue** (*Penstemon concinnus*): What impacts would the Proposed Action have on Tunnel Springs Beardtongue?
- **Long-calyx eggvetch** (*Astragalus oophorus* var. *lonchocalyx*): What impacts would the Proposed Action have on long-calyx eggvetch?
- **Vegetation**: What impacts would the surface disturbance associated with drilling, drill pad construction or cross country travel have on project area vegetation, particularly with regard to species that do not recover well or that take a long time for successful reclamation? What impacts would drilling, drill pad construction and cross country travel have on the introduction or spread of noxious weeds?
- **Visual Resources**: Would there be any impacts on visual resources within the project area as a result of the Proposed Action?
- **Recreation Resources**: How would the exploration project affect recreation in the project area?
- **Land Use**: Would there be any impact to the Spring Valley Corridor or the Lincoln County Conservation, Recreation and Development Act (LCCRDA) Corridor as a result of the Proposed Action?
- **Water Quality**: Would the Proposed Action impact groundwater quality?
- **Land with Wilderness Characteristics**: How would the Proposed Action impact land with wilderness characteristics?

1.8.2 *Public Scoping*

As required under NEPA, the BLM solicited public comments on the Proposed Action. The BLM used comments received during the scoping period to determine the following:

- important issues to be addressed,
- possible data needs and sources,
- alternatives to be assessed, and
- potential effects of the alternatives on the human environment.

A public scoping letter was sent out on September 27, 2012, and comments were requested within 30 days of receipt of that letter. The mailing list can be found in the administrative record. The U.S. Fish and Wildlife Service (USFWS) requested two raptor surveys with a 2-mile buffer zone. The two surveys are required to be at least one month apart. No other comments were received.

2.0 DESCRIPTION OF ALTERNATIVES

2.1 INTRODUCTION

This EA analyzes the Proposed Action and the No Action Alternative. The No Action Alternative is considered and analyzed to provide a baseline against which to compare the impacts of the Proposed Action. No other alternatives were brought forward for detailed analysis (see Section 2.4 for further details and rationale concerning alternatives eliminated from detailed analysis).

2.2 ALTERNATIVE A: PROPOSED ACTION

Meadow Bay is proposing an exploratory drilling program at Atlanta Mine. Surface disturbances constitute approximately 15 acres, including the construction of up to 62 drill sites during the 2014 and 2015 drilling season (generally defined as spring/summer/fall).

The following activities constitute the Proposed Action:

- Using cross country travel;
- Constructing drill pads and sumps;
- Drilling boreholes and collecting samples;
- Using existing onsite facilities (primary office, guard shack, crew quarters and geology laboratory) for temporary storage of drilling materials, equipment, and support facilities.

Figure 2-1 shows the locations of these activities and Figure 2-2 shows the existing onsite facilities that would be used during the proposed exploratory drilling operations.

Table 2-1 lists the proposed surface disturbance. All of the proposed surface disturbance would be on public lands managed by the BLM Schell FO. The allocation of acreage by activity outlined in Table 2-1 is representative of the planned exploration.

Table 2-1. Proposed Surface Disturbance under the Proposed Action

Project Component	Proposed Disturbance		
			(Acres)
Access Routes to Drill Sites	26,806	feet	9
Drill Sites (Pads and Sumps)	62	sites	5
Total Proposed Disturbance (Rounded)			15
Meadow Bay would reclaim any surface disturbance due to Meadow			
Bay activities.			

2.2.1 Project Area Location and Access

The 11,365-acre project area is located at the northern tip of the Wilson Creek Range in Lincoln County, Nevada; approximately 37 miles north of Pioche, and 17 miles east of U.S. Highway 93 (see Figure 1-1). As shown in Figure 1-1, the project area can be accessed from the north, west, southwest and northeast. However, Meadow Bay would only use Atlanta Road (Lincoln County Road 894) from the southwest for the project access. Atlanta Road originates at U.S. Highway 93.

Site access road maintenance would be conducted where necessary and could include grading and watering. Where appropriate and necessary, road base, or gravel, would be placed on the roads to reduce rutting. No other road modifications would occur.

2.2.2 Drill Site Access and Drill Road Construction

Before drilling starts, drilling equipment would be mobilized to the site by Atlanta Road from the southwest, as shown in Figure 1-1. Equipment mobilization between drill sites would use existing roads as much as possible and then be via cross country travel or access routes to drill sites. Generally, cross country travel (or access routes to drill sites) would use non-constructed “primitive” routes and no road construction would be performed. However, where ground surface conditions are not good enough for mobilization of drilling equipment, a wheeled backhoe would be used to re-contour the access routes to drill sites. All available topsoil would be removed first and stockpiled adjacent to the access routes to drill sites for future reclamation use. Balanced cut-and-fill construction would be used to the extent possible to minimize the exposed cut slopes and the volume of fill material. Access route construction within drainages would be avoided where possible. When drainages must be crossed by an access route, applicant-committed environmental protection measures (ACEPMs) would be followed to minimize the surface disturbance and erosion potential (see Section 2.2.11 for more information on ACEPMs and standard operating procedures [SOPs]). Temporary culverts may be used to minimize surface impacts. It is not anticipated that blasting would be necessary to construct roadbeds. Rock outcrops and areas of shallow soils on bedrock, where present, would be avoided whenever possible. The proposed access routes to drill sites would have an average width of 15 feet.

Locations for access routes to drill sites are shown in Figure 2-1. Total disturbance for access routes to drill sites is estimated at approximately 9 acres (see Table 2-1).

2.2.3 Drill Site Construction

Drilling would be conducted using wheeled- or track-RC drill rigs and core rigs. Before drilling starts, a wheeled backhoe would be used to prepare the drill pad. Figure 2-3 shows a typical drill pad layout.

The size of the drill pad is approximately 75 feet long and 50 feet wide. First, all available topsoil in the area to be disturbed would be removed and stockpiled in the highest corner area. Based on the site conditions, there is not much topsoil at the project site and in some areas there is no topsoil at all. Based on an average thickness of 6 inches for topsoil and a stockpiling slope of 2:1 (horizontal:vertical), the topsoil stockpile area would be approximately 30-foot by 24-foot. Second, a reserve pit (or sump) would be constructed. As shown in Figure 2-3, an approximately 60-foot long and 20-foot wide reserve pit (or sump) would be located in another corner area. The sump would be approximately 3 feet in depth with a side slope of 45 degrees. This dimension would represent the maximum size of a sump that could be used. The sump would be located at the lowest corner so that surface runoff, if any, could be collected at the sump. The sump would be normally located in cut material. However, if a sump would have to be constructed in fill material, the fill area would be compacted and lined with synthetic liners with a minimum thickness of 12 mils or other equivalent liner material to avoid soil erosion by drilling fluids. Excavated soil from the sump would be used to level the drill pad. If any trees are to be removed, they would be stockpiled separately, as shown in Figure 2-3.

2.2.4 *Drilling and Drilling Fluid*

Drill cuttings and drilling fluids would be collected and contained in the sump to prevent soil erosion and the water would be allowed to infiltrate into the subsurface. Drilling fluids would be prepared using water and one of the following three mud materials:

- (1) Super Gel-X®, a bentonite gel,
- (2) EZ-Mud® and
- (3) EZ-Mud® Plus.

Additionally, additives such as Floc 360™, Abandonite™, Alcomer 120L™, bentonite, EZ-mud™, Polyplus™ and Super Plug™ may also be used.

Which mud of the above three and which additive(s) are used during drilling depends on the formation encountered and drilling conditions. The mud is mixed in tanks under the driller's supervision. The people preparing the mud typically wear rubber gloves, rubber boots, dust masks and eye protection devices.

Drilling water would be trucked to each drill location from a 200,000-gallon water storage tank location onsite (see Figure 2-4). The water use for an average hole is estimated to be 5,000 gallons. However, up to 10,000 gallons of water may be required for a problematic hole. The existing water supply system and associated right-of-way (ROW) is also shown in Figure 2-4. Figure 2-4 shows a ROW for an existing overhead power line that supplies electricity to Atlanta Mine. The tank receives water from a pump station at another 200,000-gallon tank that derives water from a well located approximately 9 miles west-southwest of the tank at Atlanta Mine. Water and power would be obtained through existing authorized BLM ROW. The quality of the water from the well meets drinking water standards based on the laboratory analysis of water samples collected from the well on September 12, 1990.

A 10-foot surface casing would be installed for each drill hole. No other casing would be installed during the proposed exploratory drilling operations. The core type drill holes are anticipated to be 4 inches in diameter. Core holes consist of two types: vertical and deep angled. The average drilling depth for vertical core holes would be 700 feet while the average depth for the deep angled core holes would be 1,500 feet. The RC type holes are anticipated to be 6 inches in diameter and 1,000 feet in depth.

Samples would be collected during drilling operations. However, no onsite processing of the samples would be conducted. Samples would be transported to an offsite laboratory for chemical analysis.

Sumps would be fenced to prevent wildlife from possibly consuming the contaminated water. Additionally, sumps would be netted in some way to prevent birds and small mammals from becoming stuck in the residual chemicals. No sump would be left open for more than one month after drilling operations are completed.

Any drill hole subject to the Nevada Division of Water Resources regulations would be abandoned in accordance with applicable Nevada Administrative Code (NAC) 534.4369 through 534.4373 within 60 days after it is drilled. Based on exploratory drilling operations in adjacent areas, groundwater is not anticipated to be encountered during the proposed drilling operations.

As such, each borehole would be plugged in accordance with NAC 534.4371.4 through NAC 534.4371.6 by:

- (a) Removing the surface casing;
- (b) Backfilling the borehole from the bottom to within 20 feet of the surface with uncontaminated soil and/or bentonite chip in a manner that a bridge does not occur; and
- (c) Placing neat cement from 20 feet below the surface to the surface.

However, if groundwater is encountered in any drill hole, the bore hole would be plugged in accordance with NAC 534.4371.2 and NAC 534.4371.6 by:

- (a) Removing the surface casing;
- (b) Placing a bentonite grout by tremie pipe in an upward direction from the bottom of the borehole to within 20 feet of the surface; and
- (c) Placing neat cement from 20 feet below the surface to the surface.

If any drill hole produces artesian flow, the drill hole would be contained pursuant to Nevada Revised Statutes (NRS) 534.060 and NAC 534.378 and would be sealed by the method described in Subsection 2 of NAC 534.4371. If casings are set in a drill hole, either the drill hole must be completed as a well and plugged pursuant to NAC 534.420 or the casings would be completely removed from the drill hole and then be plugged in accordance with NAC 534.4369 and NAC 534.4371.

2.2.5 Existing Facilities

As shown in Figure 2-2, existing onsite facilities would be used for storage of drill pipes, drilling materials and supplies, drill samples, and construction equipment. The geology laboratory and the primary office would be used by project geologists as a logging facility for examination of drill cuttings and cores. The crew quarters would be used for onsite employees to stay during the proposed drilling operations.

The existing facilities are located on previously disturbed area with a total disturbance of approximately 6 acres (see Figure 2-2).

2.2.6 Sanitation

Up to two portable toilets would be located on-site during drilling activities. These toilets would be supplied and serviced by a local supplier. They would be removed at the end of each field season. The portable toilets would be placed on previously disturbed sites. Other materials, including scrap, trash, and unusable equipment, would be removed on a weekly basis and disposed of in accordance with federal and state regulations and laws.

2.2.7 Maintenance and/or Interim Reclamation

Meadow Bay would monitor all drilling and associated activities. Drill site monitoring would include visual inspections of the drill sumps during drill operations to ensure that the drill cuttings are contained. The constructed exploration drill pads and sumps would be maintained in operating condition until reclaimed to prevent washouts and to reduce erosion, runoff, and sedimentation. All refuse generated by the project would be hauled off-site on a regular basis and disposed of at an authorized offsite landfill facility, consistent with applicable regulations.

Routine road maintenance may be required and would consist of smoothing ruts, filling holes with fill material, grading, and reestablishing drainage control when necessary. Dust control on the roads would be accomplished by watering the roads as necessary.

The activities described in the 2012 PoO would not be conducted during severe winter conditions, in which case the project area would be stabilized using appropriate interim reclamation and site management techniques. During extended periods of nonoperation or seasonal closure of the exploration activities, all motorized equipment would be removed from the project area. Trailers may be placed on the area with existing facilities for storing drilling supplies and samples.

Once sumps have dried out, they would be backfilled and reclaimed as discussed in Section 2.2.8. No other issues related to periods of nonoperation are anticipated. All drill sites would be patrolled at the end of each drill period to ensure that all refuse and trash has been disposed of properly. In the event that fines are present below the drill sumps, the area would be scarified using a hand rake.

2.2.8 Final Reclamation

A detailed reclamation plan has been developed in the 2012 PoO. The following is a summary of the plan:

The reclamation activities would be implemented for the disturbance associated with the proposed operations and existing disturbance in the area for existing onsite building and facilities as shown in Figure 2-2.

Concurrent reclamation would take place to the degree possible by backfilling sumps, recontouring, scarifying, and seeding drill sites when the sumps become dry enough to backfill without causing a spill of drilling fluids. When a sump is not liquid-free, the following measures would be taken:

- (1) Add soil periodically to the sump to absorb the fluid without overflowing the sump;
- (2) Dig an adjacent pit to drain off excess fluids and mix with soil;
- (3) Pump out remaining fluids and dispose of properly; or
- (4) Use BLM approved flocculants.

The final grading plan for the access routes to drill sites is designed in part to minimize the visual impacts of the disturbance proposed by Meadow Bay. Slopes would be regraded with dozers, backhoes, excavators, and/or skid steers to blend with surrounding topography, interrupt straight line features and facilitate revegetation where practical. If natural drainages cross reclaimed slopes, the natural drainage channel would be re-established and best management practices (BMPs) would be implemented for erosion control.

The existing onsite building and facilities would be demolished when they are not needed using similar methods and techniques employed to demolish the old mill and crusher complex as described in the 2012 PoO. Retrievable metals would be collected and trucked to an offsite location for salvage. Construction debris and foundation materials would be crushed onsite by machinery, blasting or an appropriate manner approved by the BLM and then used to recontour the site if appropriate.

Reclaimed surfaces would be revegetated to control runoff, reduce erosion, provide forage for wildlife and livestock, and reduce visual impacts.

Seedbed preparation and reseeding efforts for areas to be revegetated would take place after placement of a minimum of 6 inches of growth media. Seedbed preparation would be performed as follows:

- (1) Compacted surface would be loosened and left in a rough condition by ripping, followed by dozer tracking or other accepted methods.
- (2) The prepared surfaces would then be seeded using the final seed mix determined by the BLM.

Should salvaged topsoil be stockpiled over one growing season (March-October), the topsoil would be seeded.

During vegetation establishment, weed control practices would be implemented to limit the growth and spread of noxious weeds, and to ensure that revegetation is successful. The control program would include, but may not be limited to, the use of weed-free straw in the reclamation program. The seed would be tested for noxious weeds planting. If noxious weed are found, the seed would be rejected.

Reclamation activities would be timed to take advantage of optimal climatic conditions if practical. However, scheduling of reclamation would occur as soon as possible after the operation activities in a particular area are completed to minimize erosion and sedimentation. During the proposed operation period, concurrent reclamation and interim reclamation would be performed where possible, to reduce erosion and weed invasion. The remainder of the revegetation would occur following the cessation of all site activities.

The existing roads to be used to mobilize equipment to and from the site are not anticipated to require reclamation since they are used by the public. However, if any damage occurs, repair and maintenance would be performed to restore the road to the existing conditions.

Any devices and equipment used during the exploratory drilling operations would be removed from the site when the exploration activities have been completed.

2.2.9 Post-reclamation Monitoring

Post-closure management would commence on any reclaimed area following completion of the reclamation work for the area and would extend until the reclamation of the site or component has been accepted by the BLM and the Nevada Department of Environmental Protection (NDEP). For bonding purposes, a three-year post-closure management period is assumed following completion of reclamation construction on any site. For sites reclaimed early in the operations, management of the reclaimed sites would occur concurrently with operational site management. Monitoring would be conducted for three consecutive years in the third quarter of each year.

2.2.10 Resource Requirements

2.2.10.1 Equipment

The following vehicles and equipment would be used in conjunction with project activities:

- Up to two wheeled or track-mounted RC or core drill rigs,

- 2,000- to 4,000-gallon water trucks; one per drill rig,
- One 5,500-gallon fuel tank placed in a synthetic membrane-lined containment pit,
- One crew vehicle (4×4 pickup) per drill rig,
- One pipe truck per drill rig,
- One auxiliary air compressor per drill rig,
- Small tracked excavator(s) or equivalent for miscellaneous site work and reclamation,
- Small tracked dozer(s) or equivalent for miscellaneous site work and reclamation,
- Wheeled backhoe(s) or equivalent for miscellaneous site maintenance, demolition, drill pad construction and reclamation,
- Wheeled skid steer(s) for reclamation,
- Tractor-trailer rig(s) for transporting equipment and materials to and from the site,
- ATV(s) and OHV(s) for miscellaneous shuttling labor and equipment, and
- Other miscellaneous tools and equipment incidental to prospecting and exploratory activities.

2.2.10.2 Personnel and Travel

The following personnel would be used in conjunction with project activities:

- Each drill rig would use a two- to four-person crew. The crew would carpool in one pickup truck to minimize the number of trips per day. Drilling would occur throughout the calendar year. Where multiple drill rigs are in use, a supervisor may also be present. The supervisor may cover multiple rigs.
- Each drill rig would have a water truck, which is expected to make at least one trip to the drill site for water each day. Depending on water needs for dust control, the water trucks may need to make multiple trips to the onsite 200,000-gallon water tank.
- A pipe truck would travel to the drill site at the beginning of work and back from the site at the completion of the work.
- Drilling muds would be delivered periodically as needed. Whenever possible, the mud would be delivered in bulk to minimize trips to the site.
- One or more Meadow Bay geologists would travel to the project each day to supervise operations.

2.2.10.3 Water Use

Meadow Bay estimates that the water use for an average hole is 5,000 gallons. However, up to 10,000 gallons of water may be required for a problematic hole. Meadow Bay would acquire or verify that all necessary waivers from the Nevada Division of Water Rights (NDWR) for temporary use of groundwater for mineral exploration are in place.

2.2.10.4 Hazardous Materials

Hazardous materials used at the project area would include diesel fuel, gasoline, and lubricating grease. Diesel fuel would be stored in a fuel delivery system on vehicles and drill rigs. For the proposed operations, a 5,500-gallon aboveground diesel fuel tank would be placed in a lined containment pit at the crew quarters. Approximately 25 pounds of lubricating grease would be stored on the drill rigs or transported by drill trucks. All containers of hazardous substances

would be labeled and handled in accordance with Nevada Department of Transportation (NDOT) and Mine Safety and Health Administration (MSHA) regulations.

2.2.11 *Applicant Committed Environmental Protection Measures*

The mineral exploration and reclamation activities proposed in the 2012 PoO have been specifically designed to prevent unnecessary or undue degradation and to comply with the environmental performance standards specified at 43 CFR 3809.420. Resource-specific environmental protection measures that Meadow Bay has committed to are described in Table 2-2.

Table 2-2. Applicant-committed Environmental Protection Measures (ACEPM)

Resource	Protection Measure
Cultural Resources	To prevent direct impacts to cultural resources, Meadow Bay will conduct inventories of cultural resources in areas of potential impact using qualified archaeologists, in consultation with the BLM. Discoveries of previously unidentified cultural sites will be evaluated for significance, or eligibility to the NRHP. Meadow Bay will ensure avoidance of all eligible or unevaluated cultural sites within the project area, with a buffer zone of at least 50 m from the nearest surface impacts. When areas of disturbance are located within 100 m of eligible or unevaluated sites, exploration activities will be monitored by a qualified archaeologist to ensure non-disturbance of cultural resources. As directed by the BLM, all surface disturbance, as shown in Figure 2-1, would avoid all eligible cultural resources. If any eligible or unevaluated cultural site is located within the area of proposed surface disturbance, the identified cultural site(s) would be avoided.
	Meadow Bay would ensure that all activities within 100 meters of a cultural discovery are halted and the discovery is appropriately protected, until the BLM Authorized Officer (AO) issues a Notice to Proceed. A Notice to Proceed may be issued by the BLM under any of the following conditions: <ul style="list-style-type: none"> • Evaluation of potentially eligible resource(s) results in a determination that the resource(s) are not eligible; • The fieldwork phase of the mitigation of adverse effects to cultural resources and treatment of historic properties has been completed; and • The BLM has accepted a summary description of the fieldwork performed and a reporting schedule for that work.
	Archaeological monitors may be required in special cases as determined by BLM to avoid cultural resources in proximity to where exploratory activities would be carried out. The BLM archaeologist would be informed prior to exploratory activities in proximity to these cultural resources that require monitoring.
	Meadow Bay will inform all persons associated with the project that knowingly disturbing cultural resources (historic or archaeological) or collecting artifacts is illegal and punishable by a fine of up to \$20,000, imprisonment up to two years, or both
Paleontological Resources	In the event that paleontological resources of potential scientific interest are encountered (including all vertebrate fossils and deposits of petrified wood) during exploration or reclamation activities, the activities would be stopped within 100 feet of the discovery, and the BLM would be notified. Activity that might impact the identified paleontological find would be suspended until after the discovery has been evaluated, any necessary mitigation measures completed, and the BLM AO has issued a written Notice to Proceed.
Solid and Hazardous Waste	Project-related trash, garbage, debris, and foreign matter would be hauled from the site on a regular basis for disposal at an offsite authorized facility; no refuse would be disposed of onsite. Site would be maintained and left in a clean and safe condition. Burning would not be allowed in the project area.
	Employees would be instructed regarding the types and locations of onsite petroleum products, as well as the health effects, hazards (such as fire and explosion), and environmental impacts associated with the products. In accordance with 29 CFR 1910.1200, a material safety data sheet (MSDS) for every chemical or hazardous material brought onsite would be kept on file at the primary office.
	Fuel would be transferred from the 5,500-gallon aboveground tank (located at the crew quarters) to and from pickup truck tanks by electric transfer pumps. A portable generator would be used at the 5,500-gallon tank location. Pickup trucks would be equipped with pumps that operate off the vehicle's electric supply. Sorbent materials shall be immediately available to control fuel spills up to 50 gallons. The fuel delivery transport operator would be certified and is the individual responsible for loading the fuel tank. Clean-up supplies would be stored on-site in conex containers.

Table 2-2. Applicant-committed Environmental Protection Measures (ACEPM)

Resource	Protection Measure
	Meadow Bay would store petroleum products such as gasoline, diesel fuel, and lubricants or any other hazardous materials in approved containers to prevent mixing, drainage, or accidents. Meadow Bay would adequately fence, post, or cover hazardous material storage areas.
	Meadow Bay would not drain oil or lubricants onto the ground surface.
	In the event hazardous or regulated materials, such as diesel fuel, are spilled, Meadow Bay would take immediate measures to control the spill. Meadow Bay would immediately clean up any spills under 25 gallons immediately and would clean up any spills over 25 gallons within 24 hours and report the incident to the BLM AO and Nevada Division of Environmental Protection. After clean up, the oil, toxic fluids, or chemicals and any contaminated material would be removed from the site and disposed of at an approved disposal facility.
	Meadow Bay would work with the BLM AO on the containment of drilling fluids and drill hole cuttings.
	All construction, operation, and maintenance activities would comply with all applicable Federal, State, and local laws and regulations regarding the use of hazardous substances and the protection of air and water quality.
Air Quality	Meadow Bay would use surface application of water from a water truck before and during surface clearing, and excavation activities to reduce fugitive dust emissions, when necessary. Meadow Bay would use surface application of water and reduced speed limits on dirt access roads or other unpaved, unvegetated surfaces as needed (for example, during high-wind conditions) to reduce fugitive dust emissions. Dragging or grading may be utilized to reduce road wear and dust generation on drill access routes.
	Drill rigs would be equipped with a cyclone to collect/sample dust to the greatest extent practicable. Drilling would be conducted using water as a dust control measure. No dry or air drilling would be conducted during exploration.
	All internal combustion equipment would be kept in good working order.
	Meadow Bay would cover construction materials and stockpiled soils if they are a source of fugitive dust.
Erosion and Sediment Control (Soil and Water Resources)	Meadow Bay would plug all drill holes per Nevada State statute (<i>NDWR Regulations for Water Well and Related Drilling</i>), as waived. If artesian flow is encountered, the drill hole would be plugged immediately. The location, depth, and relative flow rate of any water intercepted would be reported to the BLM AO. Drill cuttings would be returned to the hole if possible, or at a minimum, raked and spread out so as not to impede regrowth of vegetation or to create erosion problems.
	Meadow Bay would use specialized low-surface impact equipment (e.g., balloon tired vehicles) as determined by the BLM AO for activities in off-road areas where it is deemed necessary to protect fragile soils and other resource values.
	During periods of adverse soil moisture conditions caused by climatic factors such as thawing, heavy rains, snow, flooding, or drought, Meadow Bay would suspend activities on existing roads that could create excessive surface rutting. When adverse conditions exist, Meadow Bay would contact the BLM AO for an evaluation and decision based on soil types, soil moisture, slope, vegetation, and cover.
	Meadow Bay would use BMPs for water management measures. These measures would include contour furrowing; terracing; reduction of steep cut and fill slopes; installing water bars in appropriate locations to control runoff and erosion; using sumps to manage drilling fluids; installing silt fences, weed-free hay bales, or other sediment control structures at appropriate locations; having suitable spill control and cleanup equipment and supplies readily available; and implementing concurrent reclamation measures. When drainages must be crossed with a road, BMPs would be followed to minimize the surface disturbance and erosion potential. Temporary culverts could also be installed within the drilling area and as necessary on the access road. Maintenance of the exploration roads would include seasonal regrading when necessary. Meadow Bay would inspect erosion controls in the spring and fall and after exceptional storm events.
	Meadow Bay's restoration requirements include reshaping, recontouring, and/or resurfacing with growth medium, installation of water bars, and seeding on the contour. Removal of structures such as culverts, concrete pads, cattle guards, and signs would usually be required. Additional erosion control measures (e.g., fiber matting and barriers) to discourage road travel may be required as required by BLM.
	Meadow Bay would employ additional protective measures, such as restrictions on surface entry during periods of excessive runoff, avoidance of selected areas, and special reclamation techniques, on lands containing unstable/highly erodible soils, as determined by the BLM AO.
	Soil stockpiles and road berms, if scheduled to be left in place over the growing season, would be seeded with a BLM-approved site-specific interim seed mix to reduce erosion, preserve the biological flora and

Table 2-2. Applicant-committed Environmental Protection Measures (ACEPM)

Resource	Protection Measure
	<p>fauna, and prevent the establishment of noxious weeds and other undesirable plant species.</p> <p>To provide for effective rehabilitation of the disturbed area, all available growth media, as practical, would be removed and stockpiled. Any trees removed would be separated from soils and stockpiled separately. Meadow Bay would cover stockpiled soils if needed to minimize wind and water erosion of these stockpiles.</p>
Vegetation Resources	<p>Meadow Bay would keep removal and disturbance of vegetation to a minimum through construction site management (e.g., using previously disturbed areas and existing easements, limiting equipment/materials storage and staging area sites, etc.).</p> <p>Meadow Bay would reclaim the disturbed area concurrently or at the earliest feasible time by recontouring to conform to pre-existing topography (including filling of sumps), to the extent possible, followed by redistribution of stockpiled growth media over the reclaimed area. Compacted areas would be ripped to a depth of 12 inches unless in solid rock. Ripped areas may need further work to break up large clods and produce a fine-grained seed bed.</p> <p>Where seeding is required, Meadow Bay would use appropriate seed mixture and seeding techniques approved by the BLM AO. Meadow Bay would generally conduct reclamation with native seeds that are representative of the indigenous species present in the adjacent habitat, unless documenting rationale for potential seeding with selected non-native species. Possible exceptions would include use of non-native species for a temporary cover crop to out-compete weeds. In all cases, seed mixes would be approved by the BLM AO prior to planting. Meadow Bay would generally seed during the 3rd and 4th quarter of the year.</p> <p>Areas would be considered to be satisfactorily reclaimed when all disturbed areas have been recontoured to blend with the natural topography, erosion has been stabilized, and an acceptable vegetative cover has been established. Meadow Bay would use the Nevada Guidelines for Successful Revegetation prepared by the Nevada Division of Environmental Protection, the BLM, and the U.S. Department of Agriculture Forest Service (or most current revision or replacement of this document) to determine if revegetation is successful.</p> <p>Reclamation bond release criteria would consist of the following:</p> <p>The perennial plant cover of the reclaimed area would equal or exceed perennial cover of selected comparison areas (normally adjacent habitat). If the adjacent habitat is severely disturbed, an ecological site description may be used as a cover standard. Cover is normally canopy or foliar cover as estimated by the point intercept method. Selected cover can be determined using a method as described in Sampling Vegetation Attributes, Interagency Technical Reference, 1996, BLM/RS/ST- 96/002+1730. The Reclamation Plan for the project area would identify the site-specific release criteria and associated statistical methods in the Reclamation Plan or permit.</p> <ul style="list-style-type: none"> ○ Meadow Bay would re-spread weed-free vegetation removed from the right-of-way to provide protection, nutrient recycling, and seed source.
Wildlife – general	Project-related traffic would observe prudent speed limits (10 miles per hour [mph] for access routes to drill sites and 25 mph on existing roads in the project area) to protect wild horses, wildlife, and livestock.
Special Status Species	<p>Raptors: All hawks would be protected with a 0.5-mile buffer during the nesting season between April 1 and July 31. Eagles would be protected with a 1.0-mile buffer during the nesting season between March 15 and August 15.</p> <p>Migratory Birds: Where possible, land clearing, surface disturbance and drilling would be timed to prevent destruction or disturbance of active bird nests or young birds during the avian breeding season (April 15 to July 31) to comply with the Migratory Bird Treaty Act (MBTA). If surface-disturbing activities are unavoidable during this period, Meadow Bay would have a qualified biologist survey the areas proposed for immediate disturbance for the presence of active nests.</p> <p>If active nests are located, or if other evidence of nesting is observed (mating pairs, territorial defense, carrying of nesting material, transporting of food), the area would be avoided to prevent destruction or disturbance of nests until the young birds have fledged. Avian surveys would be conducted only during the avian breeding season and immediately prior (within 7 days) to Meadow Bay conducting exploration activities that would result in disturbance. After such surveys are performed and disturbance created (i.e., drill pad construction), Meadow Bay would not conduct any additional disturbance during the avian breeding season without first conducting another avian survey.</p>

Table 2-2. Applicant-committed Environmental Protection Measures (ACEPM)

Resource	Protection Measure
	Sage Grouse: There are two active leks within two miles of the access road to the project site. Sage grouse timing stipulations would be applied to the road within 2 miles of an active lek. The access road would not be used one hour before and three hours after sunrise between March 1 and May 15.
Invasive Nonnative Species	To eliminate the transport of vehicle-borne weed seeds, roots, or rhizomes, all vehicles and heavy equipment used for the completion, maintenance, inspection, or monitoring of ground disturbing activities; for emergency fire suppression; or for authorized off-road driving would be free of soil and debris capable of transporting weed propagules. All such vehicles and equipment would be cleaned with power or high pressure equipment at the Primary Office (See Figure 2-2) where vehicles and equipment can be washed off on sterile gravel prior to entering or leaving the work site. Vehicles used for emergency fire suppression would be cleaned as a part of check-in and demobilization procedures. Cleaning efforts would concentrate on tracks, feet and tires, and on the undercarriage. Special emphasis would be applied to axels, frames, cross members, motor mounts, and on underneath steps, running boards, and front bumper/brush guard assemblies. Vehicle cabs would be swept out, and refuse would be disposed of in waste receptacles. Cleaning sites would be recorded using global positioning systems or other mutually acceptable equipment and provided to the BLM AO. Employees and contractors would be educated to identify weeds that could spread further in the project area.
	To eliminate the transport of soil-borne noxious weed seeds, roots, or rhizomes, infested soils or materials would not be moved and redistributed on weed-free or relatively weed-free areas. In areas where infestations are identified or noted and infested soils, rock, or overburden must be moved, these materials would be salvaged and stockpiled adjacent to the area from which they were stripped. During reclamation, the materials would be returned to the area from which they were stripped. Further, all source sites such as borrow pits, fill sources, or gravel pits used to supply inorganic materials used for construction, maintenance, or reclamation would be inspected and found to be free of plant species listed on the Nevada noxious weed list or specifically identified by the BLM Schell FO. Inspections would be conducted by a BLM weed scientist or qualified biologist as needed.
	In areas of known noxious weed infestations, monitoring of noxious weeds would be conducted on an annual basis. Monitoring would be conducted until project release. If the spread of noxious weeds is noted, the infested areas would be further evaluated to determine the appropriate remedial action and appropriate treatment. Appropriate weed control procedures, including target species, timing of control, and method of control, would be determined in consultation with BLM personnel.
	No noxious weeds would be allowed on the site for reclamation release. Any noxious weeds that become established would be controlled. Bonds would be retained for weed control until the site is returned to desired vegetative conditions.
	To eliminate the introduction of noxious weed seeds, roots, or rhizomes, all interim and final seed mixes, hay, straw, or other organic products used for reclamation or stabilization activities, feed, bedding would be certified free of plant species listed on the Nevada noxious weed list or specifically identified by the BLM Schell FO.
	Removal and disturbance of vegetation would be kept to a minimum through construction site management (e.g. using previously disturbed areas and existing easements, limiting equipment/materials storage and staging area sites, etc.)
	Reclamation would normally be accomplished with native seeds only. These would be representative of the indigenous species present in the adjacent habitat. Rationale for potential seeding with selected non-native species would be documented. Possible exceptions would include use of non-native species for a temporary cover crop to out-compete weeds. Where large acreages are burned by fires and seeding is required for erosion control, all native species could be cost prohibitive and/or unavailable. In all cases, seed mixes would be approved by the BLM AO prior to planting.
Water Resources	Impacts to groundwater quality could occur if groundwater is encountered during drilling activities. Impacts would effectively be eliminated, reduced, or mitigated through the application of required stipulations and through the Nevada State statute and BLM regulations and conditions of approval. Meadow Bay would use only approved drilling fluids and would plug all drill holes per Nevada State statute (see NDWR's <i>Regulations for Water Well and Related Drilling</i> [NDWR 2010]), as waived. If artesian flow is encountered, the drill hole would be plugged immediately. In all cases, the location, depth, and relative

Table 2-2. Applicant-committed Environmental Protection Measures (ACEPM)

Resource	Protection Measure
	flow rate of any water intercepted would be reported to the Schell FO or the BLM AO.
Visual Resources	During the implementation of vegetation treatments, Meadow Bay would create irregular margins around treatment areas to better maintain and mimic the surrounding visual character of the landscape.
Fire Protection	<p>Mobile equipment would be properly muffled and equipped with suitable fire suppression equipment, such as fire extinguishers, hand tools, and portable water pumps. All applicable state and federal fire laws and regulations would be complied with, and all reasonable measures would be taken to prevent and suppress fires in the project area. Adequate fire protection/suppression equipment prescribed by the National Fire Protection Association (NFPA) Codes 10 and NFPA 30 for the quantity of fuel stored would be on-site whenever work is being conducted.</p> <p>Meadow Bay would report uncontrolled fires immediately to the BLM AO. The BLM Fire Dispatch telephone number is (775) 289-1925 or 1-800-633-6092. After working hours, staff would call 911, or the Lincoln County Sheriff's Office at (775) 962-5151.</p>
Employee Training	Meadow Bay would train employees, contractors, and other related personnel regarding the environmental and safety responsibilities required under the 2012 PoO.
Exploratory Operations	<p>Meadow Bay would notify the BLM AO within 5 days of completion of reclamation work so that timely compliance inspections can be completed.</p> <p>Any change or amendment to the exploratory operations would be brought to the attention of the BLM AO prior to implementation of the change on the ground.</p> <p>Existing access would be used whenever possible. Off-road vehicular travel would be restricted to the access routes to drill sites as shown in Figure 2-1 to complete operations. Additional access routes to drill sites, if needed, would be kept to an absolute minimum. The location of all routes would be approved by the BLM AO prior to use.</p> <p>All survey monuments claim markers, witness corners, reference monuments, bearing trees, etc., would be protected against destruction, obliteration, or damage. When operations are concluded, Meadow Bay would remove all survey markers, stakes, flagging, etc., for which Meadow Bay has no further need.</p> <p>Removal or alteration of existing improvements (fences, cattle guards, etc.) would not be allowed without prior approval of the BLM AO. Existing improvements would be maintained in a serviceable and safe condition. Upon completion of operations, any authorized facility alterations would be restored to the specifications of the BLM AO.</p> <p>Meadow Bay would work with the BLM AO on the containment of drilling fluids and drill hole cuttings.</p> <p>No more than five drill pads and drill holes would be left open at any time. No sump would be left open or unclaimed for more than one month after drilling operations are completed at the pad.</p>

2.3 ALTERNATIVE B: NO ACTION ALTERNATIVE

Under the No Action Alternative, the Proposed Action would not be approved by the BLM; however, the area would remain available for other multiple use activities as approved by the BLM. Meadow Bay would continue to explore the project area under the approved Notice, which limits surface disturbance to a maximum of 5 acres. Activities associated with this disturbance would include maintenance of existing access roads, and construction of drill pads. This acreage would be reclaimed and released by the BLM, based on compliance with the revegetation success release criteria. As a result, Meadow Bay would be able to create sequential acreage of disturbance with BLM approval.

2.4 ALTERNATIVES CONSIDERED BUT ELIMINATED FROM FURTHER ANALYSIS

Meadow Bay has chosen to resolve resource concerns surrounding proposed access through the development of route and timing options within the Proposed Action. No other alternatives or

options were considered because 1) there is no redundancy with existing roads in the Proposed Action and 2) alternate exploration development configurations would not address unresolved conflicts concerning uses of available resources.

3.0 AFFECTED ENVIRONMENT AND ENVIRONMENTAL CONSEQUENCES

3.1 INTRODUCTION

This chapter presents the potentially affected existing environment (i.e., the physical, biological, social, and economic values and resources) of the project area, issues analyzed, impacts to the analyzed resources, and proposed mitigation that could be applied to reduce those impacts.

3.2 GENERAL SETTING

The 11,365-acre project area is located at the northern tip of the Wilson Creek Range in Lincoln County, Nevada; approximately 37 miles north of Pioche, 60 miles south-southeast of Ely, and 17 miles east of U.S. Highway 93 (see Figure 1-1).

The climate and vegetation in the project area are typical of the higher elevation environment of the northern Basin and Range Province. According to the weather record between January 1, 1888 and March 31, 2013 collected at the Pioche, Nevada weather station (Western Regional Climate Center, 2013), the average annual precipitation is 13.6 inches; temperatures during the winters are cool with periods of very cold weather with average minimum/maximum temperatures in January of 20.9/42.1 degrees Fahrenheit (°F); and the summers are dry with average minimum/maximum temperatures in July of 57.8/88.7°F. Elevation in the project area ranges between 6,450 and 7,805 feet above mean sea level (amsl). The site topography varies from gently sloping to nearly vertical (on small rock outcrops in the higher elevations of the project area).

3.3 CRITICAL ELEMENTS ELIMINATED FROM ANALYSIS

Table 3-1 documents the issues' evaluation or rationale for dismissal from analysis:

Table 3-1. Resources Eliminated from Detailed Analysis in this EA

Resource	Rationale for Elimination
Wetland-riparian resources	Not present in the project area.
Prime and unique farmlands	Not present in the project area.
Livestock grazing	Due to the size of this project relative to the overall size of the grazing allotment, the phased nature of the project, and the concurrent rehabilitation, this exploration project would not affect livestock, designated animal unit months and/or BLM's Rangeland Health Standards.
Wild Horses	Due to the size of this project relative to the overall size of the herd management unit, the phased nature of the project, the concurrent rehabilitation, and the ACEPMs regarding road speed, this exploration project would not affect wild horse ability to forage, would cause minimal displacement, and minimal risk of mortality due to collisions with vehicles
Floodplains	Not present in the project area.
Forests and rangelands	No forests are present in the project area. BLM's Rangeland Health Standards would not be affected.
Wild and scenic rivers	Not present in the project area
Environmental justice	No adverse impacts that would disproportionately adversely impact minority or

Table 3-1. Resources Eliminated from Detailed Analysis in this EA

Resource	Rationale for Elimination
	low-income populations.
Wilderness	Not present in the project area. The Fortification Wilderness is only a mile northwest of the project area. The Parsnip Peak Wilderness is about 12 miles south of the project area.
Wilderness Study Areas	Wilderness Study Areas (WSA) are not present in the project area. The closest WSA is about 50 miles to the west.
Special Designations other than Designated Wilderness	Not present in the project area.
Forest Resources	Not Present in the project area.
Air quality	Scope of project would not alter air quality classification.
Mineral Resources	The Project involves exploration-based activities, such as, core sampling or removing and sampling rock chips that would not involve the removal of large volumes of earth or mineral resources from the Proposed Action are projected; therefore, mineral resources are not further analyzed in this EA.
Native American Concerns	Letters describing the Proposed Action and asking for tribal input were sent to the tribes on September 27, 2012. No comments or issues were received from any of the tribes.

3.4 CRITICAL ELEMENTS BROUGHT FORWARD FOR ANALYSIS

3.4.1 Cultural Resources

Cultural resources include archaeological resources, which are the material remains of human activity. Archaeological resources can be either prehistoric or historic in age (i.e., dating to either before or after the time of Euro-American settlement). Archaeological resources include artifacts (portable objects of human manufacture), features (i.e. firepits, houses, and other types of structures), rock art, and archaeological sites where any of the above may be found. Cultural resources can also include other types of places that are important to the heritage of contemporary peoples (e.g., traditional cultural properties).

Cultural resources are managed under a variety of laws and regulations including Section 106 of the National Historic Preservation Act of 1966 (NHPA) (36 CFR 800), which requires that federal agencies take into account the effect that a federal undertaking (or Proposed Action) may have on historic properties; i.e., any district, site, building, structure, or object that is included in or eligible for inclusion in the National Register of Historic Places (NRHP). A finding under Section 106 of the NHPA that an undertaking will adversely affect historic properties implies that there may be an impact for purposes of NEPA (40 CFR 1508.27(b)).

The project area has known cultural resources, including some sites that have been evaluated as significant and eligible to the NRHP. All areas of potential impact associated with the proposed project have been or will be inventoried for cultural resources by qualified professional archaeologists to identify National Historic Register eligible resources for avoidance by the proposed exploration activities.

3.4.1.1 Affected Environment

The project area contains eight identified NRHP-eligible cultural resource sites. Four sites (26LN6722, 26LN6723, 26LN6822 and 26LN6823) could be impacted by project related activities. Sites that are not currently identified or are unevaluated may also be affected by the Proposed Action.

3.4.1.2 Environmental Consequences

3.4.1.2.1 Proposed Action

Under the Proposed Action, construction of drill sites and sumps, drilling holes, and access routes to drill sites would cause surface and subsurface physical disturbance that could result in the destruction or inadvertent discovery of cultural resources. There would be approximately 15 acres of surface disturbance, which is 0.13% of the project area.

Direct Impact. There are 62 identified cultural properties, including eight identified NRHP-eligible sites, within the area of potential impact of the current proposed exploratory activities. Four of the eight sites (26LN6722, 26LN6723, 26LN6822 and 26LN6823) are located where the mobilization of drilling equipment could impact these sites. The other four sites are not likely to be directly affected by the Proposed Action since they are not located within any proposed drill pads, single-use access routes or existing dirt roads in the project area. Potential direct impacts to these four sites, or to previously identified or yet unidentified cultural resources would be precluded through the ACEPMs identified in Section 2.2.11:

- All previously identified NRHP-eligible sites will be avoided by project activities, such that no direct impacts to them will occur. All project activities that occur within 100 meters of any previously identified NRHP-eligible site will be monitored by a professional archaeologist. In the event that previously unidentified cultural resources are discovered, either on the surface or below the surface of the ground, work will cease immediately, and the cultural resource program at the Schell FO will be notified so that those resources can be evaluated.
- If an eligible or unevaluated cultural site is located within the area of proposed surface disturbance, the identified cultural site(s) will be avoided.

Indirect Impacts. Cultural resources can also be impacted by visual and environmental changes that affect their setting. These indirect effects may adversely affect the quality, integrity, or nature of cultural resources. Potential adverse effects associated with the proposed exploration include cutting trees for drilling access routes and other construction and clearing activities that will affect the visual setting of the significant sites. All of the NRHP-eligible cultural resource sites that have been identified within the project area are eligible for the NRHP under eligibility criterion D (i.e., due to their potential to provide important information regarding history or prehistory); thus changes in setting would not affect the characteristics of these sites that make them eligible.

Indirect impacts to cultural resources associated with drilling activities can also occur as a result of increased access to archaeological sites by workers, mine visitors, recreationists or others. Potential adverse effects include increased discovery of sites and increased visitation and inadvertent damage by workers, visitors and the public due to increase in erosion as well as

impacts to the surface and possible subsurface deposits, and the movement of artifacts within sites such that associations are lost and the potential of the site to yield significant information about the past is diminished. Potential adverse effects to cultural resources also include the removal of potentially significant artifacts, including both isolated artifacts and artifacts from the surface of archaeological sites, as artifacts have the potential to yield important information about time period, cultural affiliation, land use and other past behaviors. Potential adverse effects to archaeological sites associated with increased access and visitation also include vandalism and intentional looting of archaeological sites.

Meadow Bay's phasing and ongoing reclamation would minimize the total acreage of open access routes to drill sites available. In addition, Meadow Bay will train its employees, contractors, and other related personnel regarding legal and ethical responsibilities to leave artifacts in place and avoid impacting cultural resources, and inform mine visitors and all other persons associated with the project that collecting artifacts and disturbing archaeological sites, including historic and prehistoric cultural resources, is illegal.

3.4.1.2.2 No Action Alternative

Under the No Action Alternative, the Proposed Action would not be approved by the BLM, and the area would remain available for multiple-use activities allowed under BLM regulations. Meadow Bay would continue to explore the project area under the approved Notice, which limits surface disturbance to a maximum of 5 acres. As a result, Meadow Bay would be able to create sequential acreage of disturbance with BLM approval.

3.4.2 Paleontological Resources

Paleontological resources, or fossils, are the remains, imprints, or traces of once-living organisms preserved in rocks and sediments. These include mineralized, partially mineralized, or unmineralized bones and teeth, soft tissues, shells, wood, leaf impressions, footprints, burrows, and microscopic remains. Fossils are considered nonrenewable resources because the organisms they represent no longer exist.

3.4.2.1 Affected Environment

The BLM, in its General Procedural Guidance for Paleontological Resource Management H-8270-1 (revised 1998), classifies public lands based on the potential for paleontological "areas" to contain noteworthy occurrences of fossils.

Geologic units are defined based on physical characteristics and depositional environment, both of which are also indicative of potential to contain preserved fossils. The presence of pertinent geologic units at or near the surface can broadly predict the potential for finding important paleontological resources.

The Potential Fossil Yield Classification (PFYC) system was originally developed by the U.S. Forest Service's (USFS) Paleontology Center of Excellence, and the Region 2 (USFS) Paleo Initiative (USFS, 1996). PFYC is in the process of being formally adopted by the BLM to promote consistency between agencies and throughout the BLM. Under the PFYC system, geologic units are classified from 1 to 5 based on the relative abundance of vertebrate fossils or uncommon invertebrate or plant fossils and their sensitivity to adverse impacts, with a higher class number indicating a higher potential. The classification is not an assessment of whether important fossils are known to occur occasionally in these units; rather, it provides baseline

guidance to assess and mitigate impacts to paleontological resources. The PFYC is usually consistent within a geologic unit.

The BLM has not currently designated PFYC classifications within the project area. In a paleontological mitigation-monitoring plan prepared for the BLM Ely District Office (Murphey and DeBusk, 2011), PFYC classes were recommended for a number of geologic units identified along a transmission line route corridor in Nevada. The BLM Ely FO concurred with the PFYC recommendations for those geologic units. Although the PFYC recommendations in the monitoring plan were site-specific, it is reasonable to assume that the geologic units along the transmission line would have the same PFYC to those found in the project area, because of its similar physical characteristics and depositional environment. Using the 2011 data from Murphey and DeBusk, Table 3-2 describes the geologic units obtained from the U.S. Geological Survey (USGS) (Sweetkind and others, 2007), the associated acreage within the project area, and the recommended PFYC.

As shown in Table 3-2, the entire project area consists of sedimentary geologic units that are not likely to contain vertebrate fossils or scientifically significant nonvertebrate fossils (PFYC 2).

During the archaeological investigation conducted by Gourley et al. (2013), no paleontological resources were identified within the surveyed area.

Table 3-2. Acreage and Percentage of Project Area with Potential Paleontological Sensitivities

Geologic Unit(s)	Map Symbol	Age	Description	Project Area Acreage (Percentage)	Potential PFYC
Fine-grained younger sedimentary rock unit (primarily lacustrine and playa deposits)	FYSU	Holocene to Pleistocene	Unconsolidated basin fill, including playa, marsh, lake and alluvial-flat deposits	3,770 (33%)	2
Coarse-grained younger sedimentary rock unit	CYSU	Pliocene to Miocene	Unconsolidated basin fill, including alluvial fan and stream channel deposits	5,563 (49%)	2
Lower carbonate rock unit	LCU	Cambrian to Devonian	Cambrian Pioche shale, Eldorado dolomite, Geddes limestone, Secret Canyon shale, and Windfall formation; Ordovician Pogonip Group, Eureka Quartzite and Ely Springs dolomite; Silurian Laketown and Lone Mountain dolomite; Devon Sevy and Simonson dolomite, Guilmette and Nevada formations, and Devils Gate limestone.	2,032 (18%)	2
Sources: Sweetkind and others (2007) and Murphey and DeBusk (2011). Notes: PFYC 2: Not likely to contain vertebrate fossils or scientifically significant nonvertebrate fossils					

3.4.2.2 Environmental Consequences

3.4.2.2.1 Proposed Action

Under the Proposed Action, construction of drill sites and sumps, drilling holes, and the use of cross country travel roads would cause surface and subsurface physical disturbance that could result in the destruction or discovery/recovery of paleontological resources. There would be approximately 15 acres of surface disturbance, which is 0.13% of the project area. Based on the geologic data and paleontological survey conducted by Gourley et al. (2013), the areas are unlikely to contain vertebrate fossils or scientifically significant nonvertebrate fossils or paleontological resources. Therefore, the Proposed Action is unlikely to impact paleontological resources.

In the event that paleontological resources of potential scientific interest (including all vertebrate fossils and deposits of petrified wood) are encountered during exploration or reclamation activities, Meadow Bay would stop activities within 100 feet of the discovery and notify the BLM. Activity that might impact the identified paleontological find would be suspended until after the discovery has been evaluated, any necessary mitigation measures completed, and a BLM AO has issued a written Notice to Proceed.

3.4.2.2.2 No Action Alternative

Under the No Action Alternative, the Proposed Action would not be approved by the BLM, and the area would remain available for multiple-use activities allowed under BLM regulations. Meadow Bay would continue to explore the project area, which would include maintenance of existing access roads, use of cross country travel roads, and construction of drill pads. The potential for disturbance of paleontological resources by Meadow Bay and other users would continue to exist but would be less due to the reduced amount of surface disturbance.

3.4.3 Soil Resources

The 11,365-acre project area is used as the area of analysis for impacts to soil resources because there is little hydrological connectivity to areas outside the project area. No surface water is located within 0.5 miles down gradient from the project area, and the few ephemeral tributaries that are present on-site contain water only a few days of the year. Therefore, the primary issues related to soils are impacts to fragile soils in the project area itself and reclamation potential for disturbed areas.

3.4.3.1 Affected Environment

3.4.3.1.1 Soil Types

Natural Resources Conservation Service (NRCS) Soil Survey data (NRCS, 2007) were used to determine soil mapping units, soils series, and soil characteristics for the project area. Fifteen soil types occur in the project area. Each soil series is rated as having a slight, moderate, high, or very high water and wind erosion hazards. These ratings were developed using soil erodibility, runoff factors, and the wind erodibility index, as defined in the National Soil Survey Handbook (NRCS, 2003). Wind and water erosion hazards become critical issues when protective vegetation is removed during and following construction activities, including road construction. Typically, soils found on steeper slopes have a high water erosion hazard, and soils found on gentler slopes

have a low water erosion hazard. Finer grained soils are at greater risk of wind erosion, and soils with more gravel and/or stones have a lower risk of wind erosion.

In addition, other factors may affect reclamation following surface disturbance. Reclamation-limiting factors within the 15 soil types that would be impacted by the project consist of 1) soil drought susceptibility, 2) alkaline soils, and 3) rooting depth. Droughty soils are characterized by coarse texture, excessively rapid percolation rates (low water-holding capacity), and low organic matter content; as such, they are prone to soil erosion and have limited reclamation potential (BLM, 2007). Alkaline soils (those with a high pH value) have a low water infiltration capacity and can also limit reclamation and revegetation potential due to reduced nutrient availability. Rooting depth, or depth to bedrock, is the soil depth to fixed rock; shallow soils are often not conducive to vegetation establishment and are prone to erosion. Table 3-3 contains a summary of the acres and characteristics of soil types within the project area.

In summary, all 15 soil types (100% of project area) have features that could limit project reclamation. All soil types found in the project area are highly restrictive for droughtiness and eight soil types (61% of project area) are highly restrictive for water erosion. Ten soil types (51% of project area) would be moderately restrictive for alkalinity. Four soil types (30% of project area) are moderately restrictive for rooting depth. Eight soils types (69% of project area) are highly or moderately restrictive for wind erosion.

Table 3-3. Acres and Characteristics of Soil Types within the Project Area

Soil Type (Map Symbol)	Acres in Project Area	Percentage of Project Area	Reclamation Limiting Factors
Ursine-Escalante association (1030)	649	6%	Highly restrictive: droughtiness Moderately restrictive: alkalinity
Chuckmill-Qwynn association (1040)	1,331	12%	Highly restrictive: droughtiness Moderately restrictive: alkalinity and wind erosion
Chuckridge-Cath-Sevenmile association (1042)	492	4%	Highly restrictive: droughtiness and wind erosion Moderately restrictive: alkalinity
Ursine-Escalante-Lien association (1050)	1	0%	Highly restrictive: droughtiness Moderately restrictive: alkalinity
Kyler-Eaglepass-Rock outcrop association (1090)	338	3%	Highly restrictive: droughtiness and water erosion Moderately restrictive: alkalinity and rooting depth
Nuhelen-Chubard-Rock outcrop association (1110)	213	2%	Highly restrictive: droughtiness and water erosion Moderately restrictive: alkalinity
Farepeak-Slockey- Schoolmarm association (1113)	38	0%	Highly restrictive: droughtiness and water erosion Moderately restrictive: wind erosion
Littleailie-Lien-Sevenmile association (1138)	1,226	11%	Highly restrictive: droughtiness and wind erosion Moderately restrictive: alkalinity and rooting depth
Kyler-Amtoft-Eaglepass association (1307)	525	5%	Highly restrictive: droughtiness and water erosion Moderately restrictive: alkalinity and rooting depth

Table 3-3. Acres and Characteristics of Soil Types within the Project Area

Soil Type (Map Symbol)	Acres in Project Area	Percentage of Project Area	Reclamation Limiting Factors
Cath-Chuckridge association (1731)	626	6%	Highly restrictive: droughtiness Moderately restrictive: alkalinity
Chubard association (2296)	1,207	11%	Highly restrictive: droughtiness and water erosion Moderately restrictive: rooting depth
Newvil-Chuckmill-Sevenmile association (3870)	226	2%	Highly restrictive: droughtiness and wind erosion Moderately restrictive: alkalinity
Slockey-Hamtah-Schoolmarm association (3892)	997	9%	Highly restrictive: droughtiness and water erosion Moderately restrictive: wind erosion
Schoolmarm-Eagle-Rock outcrop association (4020)	997	9%	Highly restrictive: droughtiness and water erosion Moderately restrictive: wind erosion
Slockey-Schoolmarm association (4024)	2,500	22%	Highly restrictive: droughtiness and water erosion Moderately restrictive: wind erosion
Total	11,365	100%	

3.4.3.2 Environmental Consequences

3.4.3.2.1 Proposed Action

Construction activities could result in soil compaction, soil erosion (from wind and water), and loss of soil productivity (ability to support vegetation). Under the Proposed Action, there would be a total of approximately 15 acres of surface disturbance over the life of the project, which is 0.13% of the project area. As discussed in Section 3.2.3.1.1, most of these soils contain one or more characteristics that may limit the success of reclamation following disturbance. All soils impacted by the proposed drilling activities would be highly restrictive to reclamation due to droughtiness, eight soil types would be highly restrictive to reclamation due to water erosion and ten soil types would be moderately restrictive due to alkalinity. In addition, 30% of the soils impacted by proposed drilling activities would be moderately restrictive to reclamation due to rooting depth, and 69% of soils would have wind erosion hazards that would further limit reclamation.

The acres of surface disturbance (and percentage of total disturbance) at risk for restricted reclamation is summarized in Table 3-4.

Table 3-4. Acres of Surface Disturbance (and percentage of total disturbance) at Risk of Restricted Reclamation

Restrictions	Highly Restrictive Water Erosion Hazard	Highly/Moderately Restrictive Wind Erosion Hazard	Highly Restrictive Droughtiness	Moderately Restrictive Excess Alkalinity	Moderately Restrictive Rooting Depth
Acres (Percentage)	11 (72%)	7 (49%)	15 (100%)	4 (29%)	8 (54%)

Meadow Bay's phasing and ongoing reclamation would minimize the total acreage of access routes to drill sites and drill pads subject to wind or water erosion at any one time; only those routes needed for future exploration would remain open. Meadow Bay would also cover any stockpiled soil, if needed, to further minimize wind and water erosion. During periods of adverse soil moisture conditions caused by climatic factors such as thawing, heavy rains, snow, flooding, or drought, Meadow Bay would suspend activities on existing roads that could create excessive surface rutting. Meadow Bay would employ additional protective measures, such as restrictions on surface entry during periods of excessive runoff, avoidance of selected areas, and special reclamation techniques, on lands containing unstable/highly erodible soils, as determined by the BLM AO. Maintenance of the exploration roads would include seasonal regrading when necessary. Meadow Bay would inspect erosion controls in the spring and fall and after exceptional storm events.

All areas would be reclaimed pursuant to Meadow Bay's Reclamation Plan as described in the 2012 PoO and ACEPMS described in Section 2.2.11 which would also reduce impacts to soils in the project area.

3.4.3.2.2 No Action Alternative

Under the No Action Alternative, the Proposed Action would not be approved by the BLM, and the area would remain available for multiple-use activities allowed under BLM regulations. Meadow Bay would continue to explore the project area under the approved Notice, which limits surface disturbance to a maximum of 5 acres. As a result, Meadow Bay would be able to create sequential acreage of disturbance with BLM approval. Current impacts to soils would continue.

3.4.4 Water Resources

There is no perennial surface water body in the project area. The proposed project may have potential to impact groundwater if groundwater is encountered during exploratory drilling operations.

3.4.4.1 Affected Environment

As part of a USGS study, water-level measurements in 418 wells were used to develop a potentiometric surface map of the carbonate-rock aquifer and a water table map of the basin-fill aquifer in the Basin and Range carbonate-rock aquifer system (analysis area encompassing approximately 13,500 square miles and including most of White Pine County, Nevada, and smaller areas of adjacent counties in Nevada and Utah). The project area is located in the southeastern part of the USGS study area; specifically, the project area is located primarily at the southern end of Spring Valley with the southwestern portion of the project area in southeastern Lake Valley. The map indicates that the approximate elevation of the water-level surface in the project area is approximately 5,500 feet (Knochenmus and others, 2007). The project area elevation ranges between 6,450 and 7,805 feet; therefore, groundwater could be expected to be anywhere between 950 and 2,305 feet below the surface.

Previous exploration activities indicate that the depth to groundwater is greater than 1,500 feet. During Meadow Bay's previous exploratory drilling in the project area (holes as deep as 1,500 feet), no groundwater was encountered in any of the holes. The USGS study indicates that the groundwater in the 13,500-square-mile study area, including the project area, is generally of good quality with limited exceptions based on specific locations and proposed uses.

3.4.4.2 Environmental Consequences

3.4.4.2.1 Proposed Action

Under the Proposed Action, there would be approximately 15 acres of surface disturbance from the construction of drill sites (pads and sumps) and the use of cross country travel, which is 0.13% of the analysis area. These activities could temporarily and/or permanently change topography and current patterns of surface drainage, or degrade surface water quality due to erosion and increased sediment loading. However, there would be no direct impacts to permanent surface water resources because no such features are present in the project area. To reduce impacts to surface water resources, Meadow Bay would use the following BMPs and ACEPMs:

- Contour furrowing
- Terracing
- Reduction of steep cut and fill slopes
- Installation of water bars in appropriate locations to control runoff and erosion
- Use of sumps to manage drilling fluids
- Installation of silt fences, weed-free hay bales, or other sediment control structures, if necessary

When drainages must be crossed with a road, BMPs such as the installation of temporary culverts would be followed to minimize surface disturbance and erosion potential. Maintenance of the exploration roads would include seasonal regrading when necessary. Meadow Bay would inspect erosion controls in the spring and fall and after exceptional storm events (see Section 2.2.2.11).

Impacts to groundwater quality could occur if groundwater is encountered during drilling activities. Up to 62 drill holes are included in the Proposed Action. The average drill hole depth would be 700 feet for vertical core holes and 1,000 feet for RC holes. Drilling operations are not expected to encounter groundwater based on previous drilling operations at the mine; however, two deep angled core holes would be drilled up to 1,500 feet deep. Impacts would effectively be eliminated, reduced, or mitigated through the application of required stipulations and through the Nevada State statute and BLM regulations and conditions of approval. Meadow Bay would use only approved drilling fluids and would plug all drill holes per Nevada State statute (see NDWR's *Regulations for Water Well and Related Drilling* [NDWR, 2010]), as waived. If artesian flow is encountered, the drill hole would be plugged immediately. In all cases, the location, depth, and relative flow rate of any water intercepted would be reported to the Schell FO or the BLM AO.

A sump would be used at each drill site (up to 62 sumps) to contain drill cuttings and control drilling fluids. Surface water or groundwater contamination could occur due to leaching from the sumps. Sumps would be sized to contain up to approximately 25,000 gallons (60 feet long by 20 feet wide by 3 feet deep) with a 45-degree side slope, which previous drilling experience at the project area has shown to be adequate for surface containment of drilling fluids. Sumps would be generally constructed in cut materials. However, sumps would be lined if they must be constructed in fill material to assure that drilling fluids are contained. Standard, nontoxic drilling muds and additives such as Floc 360™, Abandonite™, Alcomer 120L™, bentonite, EZ-mud™, Polyplus™, and Super Plug™ would be used. Drill site monitoring would include visual

inspections of the drill sumps to ensure that the drill cuttings are contained. When sumps are no longer needed, they would be allowed to dry by infiltration or evaporation to prevent discharge of drilling fluids during reclamation. Sumps would be constructed to the shallowest depth possible at each particular site to allow for maximum evaporation. Sumps would be “liquid free” within 30 days of drilling completion. If extenuating circumstances exist where a sump would need to be left open, it would be handled on a case-by-case basis. Liners would either be removed, or ripped and buried in place, as determined by the BLM. Once dry, the sumps would be backfilled and graded to near original contour.

Surface and groundwater quality could also be impacted by potential spills of hazardous materials. Diesel fuel, gasoline, and lubricating grease would be stored on-site (quantities are described in Section 3.4.11.2). This risk would be minimized through application of the ACEPMs discussed in Section 2.2.11. Petroleum products or other hazardous materials would be stored in approved containers to prevent mixing, drainage, or accidents. All containers of hazardous substances would be handled in accordance with appropriate regulations.

3.4.4.2.2 No Action Alternative

Under the No Action Alternative, the Proposed Action would not be approved by the BLM, and the area would remain available for multiple-use activities allowed under BLM regulations. Meadow Bay would continue to explore the project area under the approved Notice, which limits surface disturbance to a maximum of 5 acres. The risk of impacts to water resources from construction and drilling activities and from potential spills of hazardous materials would be present, but to a lesser degree because there would be less drilling and fewer hazardous materials present.

3.4.5 Vegetation Resources

3.4.5.1 Affected Environment

3.4.5.1.1 Vegetation

Vegetation observed during biologic surveys conducted by JBR Environmental Consultants, Inc. (JBR) (2012 and 2013) consisted primarily of pinyon-juniper with little understory particularly in areas with shallow soils. A total of 45 plant species were identified during the biologic surveys (JBR, 2012 and JBR 2013). A complete list of vegetation observed during the 2012 and 2013 biologic surveys is provided in Table 3-5. Dominant species include pinyon pine (*Pinus monophylla*), Utah Juniper (*Juniperus osteosperma*), basin big sage (*Artemisia tridentata* ssp. *tridentata*), broom snakeweed (*Gutierrezia sarothrae*), sand dropseed (*Sporobolus cryptandrus*), dwarf cryptantha (*Cryptantha torreyana*) and oval-leaved buckwheat (*Eriogonum ovalifolium*).

Table 3-5. Vegetation Observed in the Project Area

Common Name	Scientific Name
yarrow	<i>Achillea millefolium</i>
Indian ricegrass	<i>Achnatherum hymenoides</i>
desert needlegrass	<i>Achnatherum speciosum</i>
pussy toes	<i>Antennaria</i> spp.
prickly poppy	<i>Argemone corymbosa</i>
black sagebrush	<i>Artemisia nova</i>
basin big sage	<i>Artemisia Tridentata</i> ssp. <i>tridentata</i>

Table 3-5. Vegetation Observed in the Project Area

Common Name	Scientific Name
crescent milkvetch	<i>Astragalus amphioxys</i>
freckled milkvetch	<i>Astragalus lentiginosus</i>
4-wing salt brush	<i>Atriplex canescens</i>
cheatgrass	<i>Bromus tectorum</i>
dunhead sedge	<i>Carex phaeocephala</i>
Indian paintbrush	<i>Castilleja chromosa</i>
rattlesnake weed	<i>Chamaesyce albomarginata</i>
yellow rabbitbrush	<i>Chrysothamnus viscidiflorus</i>
Basin yellow cryptantha	<i>Cryptantha confertifolia</i>
dwarf cryptantha	<i>Cryptantha torreyana</i> var. <i>pumila</i>
hedge-hog cactus	<i>Echinocereus engelmannii</i>
squirreltail	<i>Elymus elymoides</i>
green ephedra	<i>Ephedra viridis</i>
oval-leaved buckwheat	<i>Eriogonum ovalifolium</i>
sticky snakeweed	<i>Gutierrezia microcephala</i>
broom snakeweed	<i>Gutierrezia sarothrae</i>
hare barley	<i>Hordeum jubatum</i>
poverty sump weed	<i>Iva axillaris</i>
rush	<i>Juncus balticus</i>
Utah juniper	<i>Juniperous osteosperma</i>
mountain pepperweed	<i>Lepidium montanum</i>
horehound	<i>Marrubium vulgare</i>
plains pricklypear	<i>Opuntia polyacantha</i>
Owen's Valley beardtongue	<i>Penstemon confuses</i>
low beardtongue	<i>Penstemon humilis</i>
thickleaf beardtongue	<i>Penstemon pachyphyllus</i> var. <i>congestus</i>
Palmer's penstemon	<i>Penstemon palmeri</i>
pinyon pine	<i>Pinus monophylla</i>
stansbury cliffrose	<i>Purshia stansburiana</i>
bitter brush	<i>Purshia tridentate</i>
tumbleweed	<i>Salsola tragus</i>
California butterweed	<i>Senecio</i> spp
tumble mustard	<i>Sisymbrium altissimum</i>
globemallow	<i>Sphaeralcea coccinea</i>
sand dropseed	<i>Sporobolus cryptandrus</i>
needle and thread grass	<i>Stipa comate</i>

3.4.5.1.2 Invasive and Noxious Weeds

The BLM defines a weed as a non-native plant that disrupts or has the potential to disrupt or alter the natural ecosystem function, composition, and diversity of the site it occupies. A weed's presence deteriorates the health of the site, makes efficient use of natural resources difficult, and may interfere with management objectives for that site, because its invasiveness requires concerted efforts of manpower and resources to achieve removal. The Nevada Department of Agriculture and the U.S. Department of Agriculture maintain an official list of weed species that

are designated noxious for the State of Nevada. The Nevada Control of Insects, Pests, and Noxious Weeds Act (Nevada Revised Statutes: Chapter 555) grants the Director of the Nevada Department of Agriculture the authority to investigate and control noxious weeds. The State of Nevada has officially designated 47 weed species as noxious (Table 3-6). The following is an explanation of the categories established for noxious weeds by the Nevada Department of Agriculture (Note that these are descriptions only and that all weeds on the list would be treated equally):

Category A Weeds: (1) found or limited in distribution throughout the state; (2) actively excluded from the state and actively eradicated wherever found; (3) actively eradicated from nursery premises; and (4) control required by the state in all infestations.

Category B Weeds: (1) established in scattered populations in some counties of the state; (2) actively excluded where possible; (3) actively eradicated from nursery premises; and (4) control required by the state in areas where populations are not well-established or previously unknown to occur.

Category C Weeds: (1) currently established and generally widespread in many counties of the state; (2) actively eradicated from nursery premises; and (3) abatement at the discretion of the State Quarantine Officer.

Table 3-6. Noxious Weed Species of Potential Concern

Common Name	Scientific Name	State Category
African Rue	<i>Peganum harmala</i>	A
Australian fieldcress	<i>Rorippa austiraca</i>	A
Black henbane	<i>Hyoscyamus niger</i>	A
Camelthorn	<i>Alhagi camelorum</i>	A
Common crupina	<i>Crupina vulgaris</i>	A
Common St. Johnswort	<i>Hypericum perforatum</i>	A
Crimson fountain grass	<i>Pennisetum setaceum</i>	A
Dalmatian toadflax	<i>Linaria dalmatica</i>	A
Dyer's woad	<i>Isatis tinctoria</i>	A
Eurasian water-milfoil	<i>Myriophyllum spicatum</i>	A
Giant reed	<i>Arundo donax</i>	A
Giant salvinia	<i>Salvinia molesta</i>	A
Goatsrue	<i>Galega officinalis</i>	A
Houndstongue	<i>Cynoglossum officinale</i>	A
Hydrilla	<i>Hydrilla verticillata</i>	A
Iberian starthistle	<i>Centaurea iberica</i>	A
Malta starthistle	<i>Centaurea melitensis</i>	A
Mayweed chamomile	<i>Anthemis cotyla</i>	A
Mediterranean sage	<i>Salvia aethiopis</i>	A
Purple loosestrife	<i>Lythrum salicaria</i> , <i>L. virgatum</i> & cultivars	A
Purples starthistle	<i>Centaurea calcitrapa</i>	A
Rush skeletonweed	<i>Chondrilla juncea</i>	A
Sow thistle	<i>Sonchus arvensis</i>	A
Spotted knapweed	<i>Centaurea maculosa</i>	A
Squarrose knapweed	<i>Centaurea virgate</i>	A
Sulfur cinquefoil	<i>Potentilla recta</i>	A
Swainsonpea	<i>Sphaerophysa salsula</i>	A
Syrian been capper	<i>Zygophyllum fabago</i>	A
Yellow starthistle	<i>Centaurea solstitialis</i>	A
Yellow toadflax	<i>Linaria vulgaris</i>	A
African mustard	<i>Brassica tournefortii</i>	B

Table 3-6. Noxious Weed Species of Potential Concern

Common Name	Scientific Name	State Category
Diffuse knapweed	<i>Centaurea diffusa</i>	B
Horsenettle	<i>Solanum carolinense</i>	B
Leafy spurge	<i>Euphorbia esula</i>	B
Medusahead	<i>Tweniatherum caput-medusae</i>	B
Musk thistle	<i>Carduus nutans</i>	B
Russian knapweed	<i>Acroptilon repens</i>	B
Scotch thistle	<i>Onopordum acanthium</i>	B
Silverleaf nightshade	<i>Solanum elaeagnifolium</i>	B
Canada thistle	<i>Cirsium aarvense</i>	C
Hoary cress	<i>Cardaria draba</i>	C
Johnsongrass	<i>Sorghum halepense</i>	C
Perennial pepperweed	<i>Lepidium latifolium</i>	C
Poison-hemlock	<i>Conium maculatum</i>	C
Puncture vine	<i>Tribulus terrestris</i>	C
Salt cedar (tamarisk)	<i>Tamaris spp.</i>	C
Spotted water hemlock	<i>Cicuta maculate</i>	C

A comparison between Tables 3-5 and 3-6 indicates that no noxious weed species were identified in the surveyed areas during the biologic surveys conducted by JBR (2012 and 2013). However, cheatgrass and tumble mustard present in the proposed drill sites are invasive weeds.

3.4.5.2 Environmental Consequences

3.4.5.2.1 Proposed Action

Under the Proposed Action, direct impacts to vegetation would occur through surface disturbance and vegetation removal on approximately 15 acres of the 11,365-acre project area during the proposed exploratory drilling operations, which comprises approximately 0.13% of the project area.

Meadow Bay would reclaim all disturbed areas associated with the proposed exploratory drilling operations following the reclamation plan in the 2012 PoO. Per the ACEPMs described in Section 2.2.13, Table 2-2, Meadow Bay would generally conduct reclamation with native seeds that are representative of the indigenous species present in the adjacent habitat. Areas would be satisfactorily reclaimed when all disturbed areas have been recontoured to blend with the natural topography, erosion has been stabilized, and an acceptable vegetative cover has been established.

Indirect impacts to vegetation during the proposed drilling activities could include the introduction or spread of noxious or invasive weeds to adjacent vegetation. Clearing of vegetation during construction could allow the establishment of undesirable plants that could compete with native plants for soil and water resources and ultimately reduce foraging habitat for herbivores. High growth rate and flammability of noxious or invasive weeds also tend to increase the risk of wildfire, because the weeds provide flammable fuels in the interspecies among shrubs, making them more susceptible to large, frequent, and uncharacteristic fires (BLM, 2009). Roads, pull-offs, and other areas where vehicles may travel may result in vehicle tires and undercarriages transporting weed seeds to undisturbed locations. The area of risk for weed invasion is at least equal to the total area of the project-related disturbance, because these areas would be highly disturbed and devoid of vegetation prior to reclamation. However, because invasive weeds are frequently established along vehicle corridors, the area impacted by weeds could become larger than the area of direct disturbance.

This risk would be minimized by the ACEPMs presented in Section 2.2.11, Table 2-2, which include measures to 1) educate personnel about invasive and noxious weeds; 2) minimize transport of soil-borne noxious weed seeds, roots, or rhizomes, infested soils or materials; 3) monitor and control noxious weeds; and 4) reclaim areas with native seed representative of the indigenous species present in adjacent habitat.

3.4.5.2.2 No Action Alternative

Under the No Action Alternative, the area would remain available for other multiple use activities as approved by the BLM. Meadow Bay would continue to explore the project area under the approved Notice, which limits surface disturbance to a maximum of 5 acres. As a result, Meadow Bay would be able to create sequential acreage of disturbance with BLM approval. Impacts to vegetation would be similar to those described under the Proposed Action but would affect less acreage and be of a shorter duration.

3.4.6 Wildlife , including Raptors and other Special Status Species

3.4.6.1 Affected Environment

3.4.6.1.1 Wildlife

Biologic surveys conducted by JBR (2012 and 2013) identified six mammal species and 22 bird species in the project area. These species are summarized in Table 3-7.

Table 3-7. Wildlife Species Observed in the Project Area

Common Name	Scientific Name
Mammals	
Black tailed jack rabbit	<i>Lepus californicus</i>
Cottontail rabbit	<i>Sylvilagus nuttallii</i>
Wild horse (sign)	<i>Equus ferus</i>
Mule deer (sign)	<i>Odocoileus hemionus</i>
Pronghorn	<i>Antilocapra americana</i>
Rocky Mountain elk (sign)	<i>Cervus canadensis</i>
Birds	
Black-throated green warbler	<i>Setophaga virens</i>
Black-throated sparrow	<i>Amphispiza bilineata</i>
Blue-gray gnatcatcher	<i>Poliophtila caerulea</i>
Brewer's sparrow	<i>Spizella breweri</i>
Cassin's finch	<i>Haemorhous cassinii</i>
Chipping sparrow	<i>Spizella passerine</i>
Ferruginous hawk	<i>Buteo regalis</i>
Golden eagle	<i>Aquila chrysaetos</i>
Gray vireo	<i>Vireo vicinior</i>
Great horned owl	<i>Bubo virginianus</i>
Green swallow	<i>Tachycineta sp.</i>
Juniper titmouse	<i>Baeolophus griseus</i>
Mountain bluebird	<i>Sialia currucoides</i>
Mourning dove	<i>Zenaida macroura</i>
Night hawk	<i>Chordeiles minor</i>
Northern harrier	<i>Circus cyaneus</i>
Pinyon jay	<i>Gymnorhinus cyanocephalus</i>
Raven	<i>Corvus corax</i>

Table 3-7. Wildlife Species Observed in the Project Area

Common Name	Scientific Name
Red-tailed hawk	<i>Buteo jamaicensis</i>
Rock wren	<i>Salpinctes obsoletus</i>
Western scrub jay	<i>Aphelocoma californica</i>
White-crowned sparrow	<i>Zonotrichia leucophrys</i>

3.4.6.1.2 Migratory Birds and Raptors

The regulatory framework for protecting birds includes the Endangered Species Act (ESA), the Migratory Bird Act (MBTA) (which includes any part, nest, or egg), the Bald and Golden Eagle Protection Act (BGEA) of 1940, and EO 13186. The MBTA prohibits the take of migratory birds and does not include provisions for allowing unauthorized take. The BGEA is similar to the MBTA in that it prohibits the take of bald and golden eagles.

On April 15, 2013 and May 16, 2013, helicopter aerial raptor surveys of a 2-mile buffered project area were conducted by JBR (2013). All rocky cliffs were intensively surveyed for raptor nests.

On April 15, 2013, three stick nests were identified: one unknown, unoccupied nest on the existing mine pit wall, one golden eagle on a stick nest just outside the 2-mile buffered project area boundary, and an unknown, unoccupied stick nest just northeast of the golden eagle nest.

On May 16, 2013, all previously recorded nests were revisited and one additional unoccupied stick nest was identified. The stick nest on the wall of the existing mine pit contained two chicks and two parent red-tailed hawks were noted perched atop the mine pit wall. During the survey, a great horned owl was flushing from the existing mine pit wall opposite the red-tailed hawk nest. The golden eagle nest contained one chick. However, no adult eagles were spotted during the survey. The unknown stick nest northeast of the golden eagle nest was again unoccupied. The survey findings are shown in Figure 3-1.

3.4.6.1.3 Special Status Species

Special status species are species for which state or federal agencies afford an additional level of protection by law, regulation, or policy. Included in this category are federally listed and federally proposed species that are protected under the ESA, species considered as candidates for such listing by the U.S. Fish and Wildlife Service (USFWS), BLM sensitive species, and species that are state protected.

Tables 3-8 and 3-9 provide the wildlife special status species and the sensitive plant species with suitable habitat in the project area, respectively. These species were obtained from lists in the biological reports prepared by JBR (2012 and 2013). The JBR lists were obtained after consultation with USFWS, BLM biologist and the Nevada Natural Heritage Program (NNHP).

According to a GIS analysis, the project area overlaps with Sage Grouse Preliminary Priority Habitat (PPH); however, field verification indicates that the project area does not contain suitable habitat due to tree cover (JBR, 2012 and 2013). There is Preliminary General Habitat (PGH) and PPH along the access road to the project area. The GIS analysis also reveals that there are four active leks (Leks 1, 2, 4 and 5) and two leks pending active status (Leks 8 and 9) within a six-mile radius of the project boundaries, as shown in Figure 3-2. Figure 3-2 indicates that there are no sage grouse leks within the project area, with the closest active lek (Lek 5) being

approximately 3 miles southwest of the southwest project boundary and 4 miles southwest of the southwestern-most drill site. There are two active leks (Leks 1 and 2) within two miles of the access road. All other leks are more than 3 miles away from the access road.

Table 3-8. Wildlife Special Status Species with Potential to Occur in the Project Area and Analyses for the Project

Common Name Scientific Name	Status	Suitable Habitat	Rational
Greater sage grouse <i>Centrocercus urophasianus</i>	Federal Candidate	Breeding, nesting and brood-rearing along access road	PPH has been identified within the project area. However, a field verification revealed it was not suitable sage grouse habitat due to tree cover. The access road to the project area passes through PGH and PPH and is within two miles of two active leks.
Golden eagle <i>Aquila chrysaetos</i>	BLM Sensitive Migratory	Foraging	No suitable nest sites. Potential migration or foraging habitat. None discovered during survey.
Bald eagle <i>Haliaeetus leucocephalus</i>	BLM Sensitive Migratory	Potential upland winter foraging habitat	No known nest sites within 1 mile of the project area or access routes. No lakes within 1 mile of the project area.
Peregrine falcon <i>Falco peregrines anatum</i>	BLM Sensitive Migratory	Migration range. Not suitable nesting habitat	No suitable cliff habitat within 1-mile of proposed disturbance. None discovered during survey.
Ferruginous hawk <i>Buteo ragalis</i>	BLM Sensitive	Yes	Suitable nesting habitat in pinyon pines. None discovered during survey. Few prey species.
Pinyon jay <i>Cymnorhinum cyanocephalus</i>	BLM Sensitive	Yes	Suitable foraging and breeding pinyon-juniper habitat. One individual visually recorded during site survey, no nest discovered.
Northern goshawk <i>Accipiter gentilis</i>	BLM Sensitive	Potential foraging	Prefers high altitude mixed conifer forests for breeding. Few prey species. No nests or individuals discovered within 0.5 mile of project site or access route during site review.
Brewer's sparrow <i>Spizella breweri</i>	BLM Sensitive Migratory	Potential nesting habitat	Suitable sagebrush, pinyon-juniper habitat. Prefers sagebrush deserts and alpine meadows. One Brewer's sparrow was recorded by auditory identification during site survey, no nest discovered.

Table 3-8. Wildlife Special Status Species with Potential to Occur in the Project Area and Analyses for the Project

Common Name Scientific Name	Status	Suitable Habitat	Rational
California myotis (<i>Myotis californicus</i>) Western small-footed myotis (<i>Myotis ciliolabrum</i>) Long-eared myotis (<i>Myotis volans</i>) Little brown myotis (<i>Myotis lucifugus</i>) Fringed myotis (<i>Myotis thysanodes</i>) Long-legged myotis (<i>Myotis volans</i>) Yuma myotis (<i>Myotis yumanensis</i>)	BLM Sensitive	Potential foraging habitat.	No suitable roosting or nesting habitat. These myotis prefer mines, caves, and rock crevices. No suitable watering sites.
Pygmy Rabbit <i>Brachylagus idahoensis</i>	BLM Sensitive	Potential in depressional drainage area.	Suitable sagebrush habitat below 8,500 feet msl is present in the depression at the northern end of project area. This area is not within the footprint or access roads of the proposed drill sites. Most of the project site is unsuitable for burrowing animals. No burrows or individuals were discovered during site review. This species has been recorded 6.7 miles northwest of the study area in the low lands (NNHP 2012).

Table 3-8. Wildlife Special Status Species with Potential to Occur in the Project Area and Analyses for the Project

Common Name <i>Scientific Name</i>	Status	Suitable Habitat	Rational
Townsend's Big-eared Bat (<i>Corynorhinus townsendii</i>) Spotted Bat (<i>Euderma maculatum</i>) Big brown bat (<i>Eptesicus fuscus</i>) Western pipistrelle (<i>Pipistrellus hesperus</i>) Greater western mastiff bat (<i>Eumops perotis californicus</i>) Silver-haired bat (<i>Lasionycteris noctivagans</i>), Western red bat (<i>Lasiurus blossevillei</i>), Hoary bat (<i>Lasiurus cinereus</i>), Brazilian free-tailed bat (<i>Tadarida brasiliensis</i>), Pallid bat (<i>Antrozous pallidus</i>)	BLM Sensitive	Potential foraging habitat.	No suitable roosting or nesting habitat. These bats tend to prefer mines, caves, and rock crevices. No suitable watering sites.

Table 3-9. Sensitive Plant Species with Potential to Occur in the Project Area and Analyses for the Project

Common Name <i>Scientific Name</i>	Current Status	Known Habitat Requirements*	Site Review For Species
Long-calyx eggvetch <i>Astragalus oophorus</i> var. <i>lonchocalyx</i>	BLM Sensitive	P/J, sagebrush and mixed desert shrub communities. 5,800 – 7,500 feet msl. Pods bladderly-inflated, ellipsoid, 25-55 mm long, 10-30 mm wide, glabrous, unilocular, often mottled (Welsh, 1993).	Potential. None discovered during site review.
Tunnel Springs beardtongue <i>Penstemon concinnus</i>	BLM Sensitive	Gravelly alluvial soils in P/J community. Flowers May – June. 6,200 – 6,600 feet msl. Species recorded near Big Springs road and Johnson Ranch road junction.*	None discovered during site review.

* Nevada Rare Plant Atlas, August 8, 2001

3.4.6.2 Environmental Consequences

3.4.6.2.1 Proposed Action

Wildlife

Impacts as a result of the Proposed Action would be similar for all wildlife species encountered in the project area and would generally consist of temporary habitat loss, disturbance from human activity and noise, and individual injury or mortality from vehicular collisions or drowning in sumps.

There would be temporary surface disturbance of 15 acres of existing wildlife habitat from exploration activities, which comprises approximately 0.13% of the project area. Meadow Bay would reclaim all areas with native seeds that are representative of the indigenous species present in the adjacent habitat. Therefore, the quality, quantity, and distribution of suitable wildlife habitat are not expected to be substantially altered by project implementation.

Disturbance to wildlife from human activity and noise would likely be limited to temporary auditory and visual disturbances to individuals foraging in or near exploration activities. Individuals would likely leave the immediate area, resulting in a temporary spatial redistribution of individuals or habitat-use patterns during exploration activities; this would not be a long-term effect because undisturbed and suitable habitat exists around the drill sites. A maximum of two drill rigs would be operating at one time, allowing wildlife to move around and between project activities.

Transportation associated with the Proposed Action would result in increased risk of vehicle-animal collisions on access roads or drill roads due to increased traffic associated with project activities. There would be approximately 26,806 feet of access routes to drill sites (about 5.1 miles). The southwestern access road, which would be the only site access road, would be 19.6 miles long from U.S. Highway 93. Risk of wildlife-vehicular collisions from project-related traffic would be reduced through prudent speed limits on all access roads. Sumps would be constructed to the shallowest depth possible to allow for maximum evaporation, and at least one side of a sump would be sloped for easy access/egress. Sumps are expected to dry quickly. With the ACEPMs presented in Section 2.2.11, potential adverse impacts to wildlife would be minimized.

Migratory Birds and Raptors

Impacts to migratory birds include temporary loss of habitat due to removal of a maximum of 15 acres of vegetation; abandonment of nests during breeding seasons because of noise or human activity; and potential mortality due to vehicular collisions, construction, or exploration activities. These impacts would be minimized by the ACEPMs presented in Section 2.2.11. There is suitable habitat adjacent to the project area that is available for nesting. Meadow Bay's phasing and ongoing reclamation would minimize the total acreage of disturbance at any one time. Wherever possible, Meadow Bay would time land clearing, surface disturbance, and drilling activities to prevent potential disturbance to or destruction of active bird nests or young birds during the nesting season (April 15–July 31). If surface-disturbing activities are unavoidable during this period, Meadow Bay would have a qualified biologist survey the areas proposed for immediate disturbance for the presence of active nests. If active nests are located,

or if other evidence of nesting is observed (mating pairs, territorial defense, carrying of nesting material, transporting of food), the nest would be avoided with an appropriate buffer to prevent destruction or disturbance of nests until young birds have fledged. Bird surveys would be conducted only during the bird breeding season and immediately prior (within seven days) to Meadow Bay's exploration activities that would result in disturbance. After such surveys are performed and disturbance created (i.e., drill pad development), Meadow Bay would not conduct any additional disturbance during the bird breeding season without first conducting another bird survey.

Migratory birds could also be attracted to drilling mud sumps. However, with the ACEPMs presented in Section 2.2.11, potential adverse impacts to migratory birds would be minimized.

Indirect impacts to raptors under the Proposed Action could include a temporary relocation of prey away from the project area due to construction noise and activity within the proposed disturbance areas; however, there is suitable habitat for displaced prey adjacent to the project area that would be available for hunting.

Special Status Species

The direct disturbance of approximately 15 acres of vegetation during the proposed drilling activities would result in an approximately 0.13% loss of the 11,365-acre project area for food, forage, or cover for BLM sensitive species.

Meadow Bay would reclaim all areas within two years. Per the ACEPMs described in Section 2.2.11, Meadow Bay would generally conduct reclamation with native seeds that are representative of the indigenous species present in the adjacent habitat.

Possible direct mortality to sage grouse and disturbance to nesting grouse may occur near the access road. Indirect impacts specific to the sage grouse would include potential abandonment of nests during breeding seasons due to noise. Although the project area does not contain suitable habitat, breeding, nesting, and brood-rearing habitat exists in sagebrush communities north of the project area and along the access road.

Sage grouse timing stipulations during the breeding season would be applied to the access road within 2 miles of an active lek to prevent disturbance. The project access road would not be used one hour before and three hours after sunrise between March 1 and May 15.

3.4.6.2.2 No Action Alternative

Under the No Action Alternative, the area would remain available for other multiple use activities as approved by the BLM. Meadow Bay would continue to explore the project area under the approved Notice, which limits surface disturbance to a maximum of 5 acres. As a result, Meadow Bay would be able to create sequential acreage of disturbance with BLM approval. Impacts to wildlife would be similar to those described under the Proposed Action but would affect less acreage and be of a shorter duration.

3.4.7 Visual Resources

Visual resource management (VRM) is a system for minimizing the visual impacts of surface-disturbing activities and maintaining scenic values for the future. Visual resources consist of landforms, vegetation, bodies of water and human-made structures. These elements of the landscape can be described in terms of their form, line, color, and texture. Visual resources are

identified through the VRM inventory. This inventory consists of a scenic quality evaluation, sensitivity level analysis and a delineation of distance zones. Based on these factors, BLM-administered lands are placed into four visual resource inventory classes: VRM Class I, II, III and IV. Class I and II are the most valued, Class III represents a moderate value and Class IV is of the least value. VRM classes serve two purposes: (1) as an inventory tool that portrays the relative value of visual resources in the area, and (2) as a management tool that provides an objective for managing visual resources.

To effectively evaluate the visual impacts of a proposed project, a contrast rating is done from the most critical viewpoints, called key observation points (KOPs). This is usually along commonly traveled routes or at other likely observation points. Using the BLM Form 8400-4-Visual Contrast Rating Worksheet, the degree of visual contrasts can be evaluated from each KOP based on the form, line, color, and texture changes between the existing landscapes and how the landscapes would look after implementation of the Proposed Action. The analysis area for impacts to visual resources consists of the project area and all areas within a 5-mile radius around the project area, which roughly marks the background views and an area from which a casual observer may distinguish elements of the Proposed Action.

3.4.7.1 Affected Environment

The project area, Atlanta Hills, is located near the north end of the Wilson Creek Range. The Atlanta Hills consist of dolomite, limestone and minor amounts of sandstone and quartzite from the Devonian Era (Steward and Carlson, 1978). Atlanta Peak located in the southeastern corner of the project area is 7,805 feet amsl. The lower elevation areas consist of alluvial deposits from erosion of the Atlanta Hills. The western drill sites are within welded and non-welded silicic ash-flow tuffs from the early Oligocene to early Miocene Era. Vegetation typical of the Great Basin occurs throughout the project area. Vegetation consists primarily of pinyon-juniper with little understory, particularly in areas with shallow soils. Exposed gray, and tan-colored soils also add contrasts and scenic quality to the area. Most of the project area is within VRM Class II with a portion of the project area within VRM Class IV (Figure 3-3). The objective of VRM Class II is “to retain the existing character of the landscape. The level of change to the characteristic landscape should be low. Contrasts are seen but must not attract attention”. The objective of VRM Class IV is “to provide for management activities which require major modification of the existing character of the landscape. The level of change to the characteristic landscape can be high. Any contrast attracts attention and is a dominant feature of the landscape in terms of scale, but it should repeat the form, line, color, and texture of the characteristic landscape” (BLM, 1986).

3.4.7.2 Environmental Consequences

There are no private residences, major roadways, recreation sites, scenic overlooks, or other destinations in and near the project area that would be considered a critical KOP; however, 10 KOPs were identified along the main project access road and local trails in the project area as the primary public view of the Proposed Action (Figure 3-4). The evaluation at each KOP using BLM Form 8400-4-Visual Contrast Rating Worksheet is attached in Appendix B. Photographs 1 through 12 were taken from the 10 KOPs. Views from each photograph are summarized below:



Photograph 1: This photograph was taken at KOP 1 (view looking southeast towards flagged drill sites within a VRM Class II area). KOP 1 is located at the junction of two undeveloped trails. Foreground views are relatively flat lowlands with sparse to dense shrub and trees and brown soils. Middle ground views are green trees and a rolling knoll with apparent green and grey colors. Background views are the blue sky with white clouds. A dirt path forms a short curving line. Trees and mountain ridges form a rugged line across the blue sky. Flagged drill pads are not visible at this KOP. However, it is possible that a passer-by may see drill rigs from this KOP with binoculars during drilling operations. The level of change to the characteristic landscape resulting from the proposed exploratory drilling operations would be negligible and contrasts would not attract attention.



Photograph 2: This photograph was taken at KOP 2 (view looking north-northwest towards flagged drill sites within a VRM Class II area). KOP 2 is located on a dirt road. Foreground views are somewhat rolling lowland with gray to brown soils and gray, yellow and dark green junipers and brushes. Middle ground views are dense green junipers. Background views are the blue sky with white clouds and green junipers and the rolling mountain top. None of the flagged drill sites can be seen from this KOP since the junipers obscured the view. It is possible that a passer-by may see the track of cross country travel road after construction equipment is mobilized through this area. The level of change to the characteristic landscape would be negligible and contrasts would not attract attention.



Photograph 3. This photograph was also taken at KOP 2 (view looking east-southeast towards a flagged drill site within a VRM Class II area). Foreground views are brown soils with green weed and brush patches, sloping hills. Middle ground views are a gray power pole, dark green dense junipers and rolling hills. Background views are the blue sky and power lines. The flagged drill site is obscured by junipers. The level of change to the characteristic landscape would be zero and contrasts would not attract attention.



Photograph 4. This photograph was taken at KOP 3 (view looking west-northwest towards flagged drill sites within a VRM Class II area). Foreground views are dark green brushes on relatively flat ground with brown soils. Middle ground views are dense green junipers. Background views are the blue sky with white clouds. No flagged drill sites are visible from this KOP. The level of change to the characteristic landscape would be zero and contrasts would not attract attention.



Photograph 5. This photograph was taken also at KOP 3 (view looking west-southwest towards a flagged drill site within a VRM Class II area). Foreground views are scattered green brushes with light-brown soil exposed on relatively flat ground. Middle ground views are dense dark green junipers. Background views are the cloudy sky. The junipers form a smooth to rugged line across the skyline. From this KOP, no flagged drill site is visible. The level of change to the characteristic landscape would be zero and contrasts would not attract attention.



Photographs 6. This photograph was taken at KOP 4 (view looking west towards flagged drill sites within a VRM Class II area). KOP 4 is located on a dirt road and near an abandoned tailings pond. Foreground views are gray and brown soils on the dirt road, brown tailings in the pond, and green and yellowish green brushes and green weeds. Middle ground views are green junipers, brushes and weeds on slopes, brown soils on the dirt road, brown tailings in the pond, and rolling hills and ridges from a far distance. Background views are upper parts of green junipers and the blue sky with white clouds. The dirt road forms a curving line and the junipers and mountain ridges form a rugged line across the skyline. No drill sites are visible from this KOP. The level of change to the characteristic landscape would be zero and contrasts would not attract attention.



Photograph 7. This photograph was taken at KOP 5 (view looking north towards flagged drill sites within a VRM Class II area). KOP 5 is located on Atlanta Road. The foreground views are gray to brown soils exposed on Atlanta Road, green brushes on slopes. Middle ground views are green brushes on slopes, gray gravel and brown soils resulting from previous mining activities at the mine, power poles, dimly visible power lines, dark green junipers on a hill slopes and rolling landscape from the knoll. Background views are the blue sky with white clouds. The dirt road form a curving line and the rolling terrain and the knoll form a rippling smooth to rugged line across the skyline. No drill sites are visible from this KOP. The level of change to the characteristic landscape would be zero and contrasts would not attract attention.



Photograph 8. This photograph was taken at KOP 6 (view looking north towards flagged drill sites within a VRM Class IV area). KOP 6 is located at the junction of Atlanta Road and a local gravel road. Foreground views are gray gravel and brown soils on roads, brown tailing piles from previous mining activities at the mine and sparse to dense green weeds and brushes between roads. Middle ground views are gray gravel and brown soils on slopes and brown soil piles on the mining site, green brushes on slopes, dark green junipers between roads, and dimly visible rolling reddish hills from a far distance. Background views are dark green junipers and the blue sky. The roads form curving lines. No drill sites are visible from this KOP. The level of change to the characteristic landscape would be zero and contrasts would not attract attention.



Photograph 9. This photograph was taken at KOP 7 (view looking north towards flagged drill sites within a VRM Class IV area). KOP 7 is located at the junction of Atlanta Road and an unnamed road leading towards Utah. Foreground and middle ground views are gray to brown soils on flat roads. Background views are dense dark green junipers, a rolling hill and the blue sky with white clouds. The roads form somewhat straight lines, and the trees and the hill ridges form a rippling line across the skyline. No drill sites are visible from this KOP. To a passer-by through this KOP, the proposed project would not cause any landscape change.



Photograph 10. This photograph was taken at KOP 8 (view looking south towards the mine). KOP 8 is located at the junction of Atlanta Road and a local dirt road. Foreground views are gray to brown soils on the flat road and green weeds and brushes on flat lands along the roadsides. Middle ground views are gray to brown soils on the flat road, green weed and brushes and several dark green trees on flat lands on both sides of the road, and rolling green terrains with gray to brown soil scars resulting from previous mining activities at the mine site. Atlanta Road forms a curving line and the rolling terrain forms an undulating line across the skyline. No drill sites are visible from this KOP. It is possible that a passer-by traveling through this KOP may see drill rigs during drilling at some drill pads in the VRM Class IV area during drilling operations. However, the contrast would not dominate the feature of the landscape in terms of scale.



Photograph 11. This photograph was taken at KOP 9 (view looking south towards Atlanta Mine). KOP 9 is located on Atlanta Road and about 1 mile north of the northernmost project area boundary. Foreground, middle ground and background view from KOP 9 are similar to those of KOP 8. However, no drill pads or drill rigs would be visible from KOP 9 during drilling operations. To a passer-by traveling through this KOP, the proposed project would not cause any landscape change or any attention.



Photograph 12. This photograph was taken at KOP 10 (view looking south towards Atlanta Mine). KOP 10 is located on Atlanta Road and about 5 mile north of the northernmost project area boundary. Foreground, middle ground and background view from KOP 10 are similar to those of KOP 9. No drill pads or drill rigs during drilling would be visible from KOP 10. To a passer-by traveling through this KOP, the proposed project would not cause any landscape change or any attention.

3.4.7.2.1 *Proposed Action*

Under the Proposed Action, there would be exploratory drilling activities in the project area. Based on discussions presented with photographs 1 through 12 taken at 10 KOPs, it was determined that:

In the VRM Class II area, the proposed exploratory drilling operations would have weak contrasts to the existing topography and landform, and to the existing vegetation and soil surfaces. The contrasts would not attract the attention of viewers. Therefore, the objective of VRM Class II would still be satisfied.

In the VRM Class IV area, weak to moderate contrasts begin to attract the attention of viewers but do not dominate the characteristic landscape. The existing form, line, color, and texture of the characteristic landscape would not be altered. Therefore, the objective of VRM Class IV would still be met.

Moreover, Meadow Bay would implement the ACEPM described in Section 2.2.11 to minimize any potential visual impact.

3.4.7.2.2 *No Action Alternative*

Under the No Action Alternative, the area would remain available for other multiple-use activities, as approved by the BLM. Meadow Bay would continue to explore the project area under the approved Notice, which limits surface disturbance to a maximum of 5 acres. As a result, Meadow Bay would be able to create sequential acreage of disturbance with BLM approval. There would still be changes to form, line, color, and texture of the existing natural vegetation and rolling topography throughout the area, but impacts at any one time would be less due to the lower level of concurrent development.

3.4.8 ***Land Use***

The proposed project is located entirely on public land administered by the BLM-Schell FO in the northeastern corner of Lincoln County (see Figure 1-1).

3.4.8.1 **Affected Environment**

Lincoln County is primarily underdeveloped public land administered by BLM with expansive open space areas consisting of several mountain ranges and dry lake beds (U.S. Air Force, 2005). The public lands in Lincoln County have been designated for a variety of uses, which include agricultural, residential, commercial and recreational activities such as mining, hunting and camping (U.S. Air Force, 1999). See Section 3.2.9 for a discussion of recreational activities.

There are two designated utility corridors: Spring Valley Corridor and the corridor designated by the Lincoln County Conservation, Recreation and Development Act (LCCRDA) of 2004, also called LCCRDA Corridor, as shown in Figure 3-5. According to LCCRDA Title III, Sec. 301(b)(1), Sec. 301(c) and the 2008 Ely District ROD/Approved RMP (Map 21), public lands within the LCCRDA Corridor are withdrawn from location, entry, and patent under the mining laws and operation of the mineral leasing and geothermal leasing laws, while the public lands within the Spring Valley Corridor are not.

As shown in Figure 3-5, no drill holes, drill pads or access routes to drill sites would be located within the 0.5-mile wide LCCRDA Corridor. However, up to 11 drill holes in the eastern project area would be located within the 0.5-mile wide Spring Valley Corridor. The intent of the Spring

Valley Corridor was only for the pipeline alignment proposed by the Southern Nevada Water Authority and mineral entry within the corridor was not withdrawn.

3.4.8.2 **Environmental Consequences**

3.4.8.2.1 *Proposed Action*

Implementation of the Proposed Action would not result in a change of land use. Since no drill holes are located within the LCCRDA Corridor, there would be no impact to the LCCRD Corridor.

Therefore, the Proposed Action would have minimal impact on land use.

3.4.8.2.2 *No Action Alternative*

Under the No Action Alternative, Meadow Bay would continue to explore the project area under the approved Notice, which limits surface disturbance to a maximum of 5 acres. There would still be drilling activities within the Spring Valley Corridor, but impacts would be less due to the lower level of development.

3.4.9 **Land with Wilderness Characteristics**

On June 1, 2011, the Secretary of the Department of the Interior issued a memorandum to the BLM Director that in part affirms BLM's obligations relating to wilderness characteristics under Sections 201 and 202 of FLPMA. BLM released Manuals 6310 and 6320 in March 2012, which provide direction on how to conduct and maintain wilderness characteristics inventories and provide guidance on how to consider whether to update a wilderness characteristics inventory.

The primary function of an inventory is to determine the presence or absence of wilderness characteristics. An area having wilderness characteristics is defined by:

- Size – at least 5,000 acres of contiguous, roadless federal land,
- Naturalness, and
- Outstanding opportunities for solitude or primitive and unconfined types of recreation.

The area may also contain supplemental values (ecological, geological, or other features of scientific, educational, scenic, or historical values).

3.4.9.1 **Affected Environment**

The Nevada BLM completed the original wilderness review in 1979, and issued an initial wilderness inventory decision in 1980. At that time, the project area was not found to possess wilderness characteristics.

In 2011, the BLM Ely District Office began updating the lands with wilderness characteristics (LWC) inventory on a project-by-project basis until there is a land use plan revision. The project area has had an inventory update. One unit was found to possess LWC. There has not been a land use plan amendment to determine if or how the LWC unit would be preserved to protect the wilderness characteristics. The wilderness characteristics information of the unit is summarized in Table 3-10. The LWC unit location in the project area is shown in Figure 3-6.

Table 3-10. Land with Wilderness Characteristics

Area Unique Identifier	Sufficient Size?	Naturalness?	Outstanding Solitude?	Outstanding Primitive & Unconfined Recreation?	Supplemental Value?	Does the Unit Possess LWC
NV-040-177C-3-2011	Yes, 16985 Acres	Yes	Yes	Yes	Red Volcanic Outcrops	Yes

As shown in Figure 3-6, the unit (NV-040-177C-3-2011) of LWC found in the recent (2011) inventory lies to the south of a road in the project area. One proposed drill site and an approximately 0.1-mile access route to the drill site is located within this LWC unit.

3.4.9.2 Environmental Consequences

3.4.9.2.1 Proposed Action

As stated above, there has not been a land use plan amendment to determine if or how the LWC unit would be protected to preserve the wilderness characteristics found in the recent inventory update. At the time of an RMP amendment, the unit would be further evaluated, and if determined to be protected for wilderness characteristics, prescriptions would be set at that time.

Under the Proposed Action, temporary disturbance of approximately 0.27 acres would occur for one drill pad and the access route to the drill site. This would not drive the unit below the size threshold, should it be determined in the future to be protected for its LWC.

Solitude would be impacted along this northern edge of the unit during drilling. However, with such a small area being impacted along a road, the overall impact within the unit would be negligible. Opportunities for primitive and unconfined recreation would not be impacted within the unit.

Moreover, Meadow Bay would implement the ACEPM described in Section 2.2.11 to further minimize any impact on the LWC unit.

3.4.9.2.2 No Action Alternative

Under the No Action Alternative, Meadow Bay would continue to explore the project area under the approved Notice, which limits surface disturbance to a maximum of 5 acres. There would still be drilling activities for one drill site within the LWC. The impact to the LWC would be the same as the Proposed Action.

3.4.10 Recreation Resources

As described in Section 3.2.8, Land Use, the proposed activities would occur on public lands administered by the BLM-Schell FO within Lincoln County.

3.4.10.1 Affected Environment

According to the 2010 Lincoln County Public Lands Policy Plan, recreational sites in Lincoln County are predominantly federally owned and managed, with the state and county having smaller portion of properties. BLM and USFWS provide developed and undeveloped recreational sites throughout the county. One of the unofficial trends regarding recreation on federally-administered land is called “dispersed recreation”. These areas are generally more remote, less developed, and in many cases, more difficult to access. This type of use is very

popular in Lincoln County. Dispersed recreation can provide, in a remote setting, the solitude a visitor desires versus the high density uses of a developed camping area. Historically, recreation within Lincoln County primarily focused on heritage tourism, hunting, fishing, hiking and camping. The proposed project is not located in any recreational facilities.

Recreational facilities that are located within the vicinity of the project area include the following:

- **Fortification Range Wilderness Area:** This wilderness area is managed by the BLM-Ely FO and is located approximately 1-2 miles north of the project area. The 13.5-mile long Fortification Range is 30,656 acres in area and 6,150-8,268 feet in elevation. The range is a low mountain range composed almost entirely of volcanic materials (tuffs and tuffaceous breccia). Most of the range is comprised of gentle ridges. However, the north end becomes very rugged and precipitous where the rock has been eroded into sheer cliffs and massive outcrops. Outstanding opportunities for primitive recreation exist within the range, including hiking, camping, backpacking, photographing, nature study, horseback riding and hunting (BLM, 2013a).
- **Parsnip Peak Wilderness Area:** This wilderness area is managed by the BLM-Ely FO and is located approximately 10 miles south of the project area. The 63,693-acre Parsnip Peak Wilderness area is 6,160-8,916 feet in elevation and is pristine with riparian corridors, wildlife and forested mountains. The wilderness area is good for hiking and camping, backpacking, horseback riding, rock climbing, hunting and trapping plus the study of archaeology and geology (BLM, 2009).
- **White Rock Range Wilderness Area:** This wilderness area is managed by the BLM-Ely FO and is located approximately 20 miles southeast of the project area. The 22,413-acre wilderness area is 6,320-9,146 feet in elevation. The wilderness area is a rarely visited pristine range with gently rolling foothills covered in sagebrush, pinyon pine and juniper, and scattered ponderosa pines. Solitude and primitive recreational opportunities are easy to find in this wilderness area with its varied topography and remoteness. Activities include hiking, camping, backpacking, horseback riding and hunting (BLM, 2013b).

Many recreational activities occur on public land administered by the BLM that is outside of the established recreational facilities listed above. Additional opportunities for recreation include wildlife viewing, hiking, camping, OHV activities, horseback riding, land sailing, rock hounding, recreational mining and hunting.

Hunting activities within the State of Nevada are managed by the Nevada Department of Wildlife (NDOW). Bighorn sheep, mule deer, pronghorn antelopes, Rocky Mountain elk, mountain goat and upland game are hunted throughout this region of the state. While the hunting seasons vary for each game species, the seasons generally occur in the fall months (U.S. Air Force, 2008).

OHV activities including races frequently occur east of U.S. Highway 93 in the vicinity of Alamo (U.S. Air Force, 2008). Such activities may include OHV races, which are often scheduled throughout the year.

At Atlanta Mine, OHV activities and hunting may occur during the fall months. There are several undeveloped paths and a county road in the project area. Mule deer, Rocky Mountain elk and feral horse are present in the project area (JBR, 2012).

3.4.10.2 Environmental Consequences

3.4.10.2.1 Proposed Action

Under the Proposed Action, access to and within the project area would remain open to the public. This would allow existing recreational uses to continue; however, the sump portion of each of the 62 drill sites would be unavailable for recreational use while being actively used during the proposed exploration activities (approximately two years). Concurrent reclamation would take place where possible, which would reduce the total acreage impacted or unavailable for access at any one time to less than the sum of the acreage associated with all 62 sumps. Additionally, the presence of drill rigs, vehicles, and workers would likely deter recreation in areas that are undergoing active exploration activities.

The noise and visual disturbance from exploration activities would reduce the quality of the recreational experience for certain users within or near the 11,365-acre project area. The noise could also impact hunting by affecting the distribution or abundance of wildlife species available for hunting or viewing. Although there would be no apparent contrasts visible within portions of the project area, the project area is screened from view from the surrounding areas, and contrasts would not attract the attention of viewers traveling through the project area (see Section 3.2.7). Noise levels would attenuate to background levels outside the project area. Project activities are likely to minimally impact tourism in the project area because most of the recreation within the project area is done by ranchers, and some dispersed recreationists.

Indirect impacts include potential for unauthorized off-road travel on access routes to drill sites. The proposed drilling activities would include approximately 5.1 miles of the access routes to drill sites. The potential for these impacts would be further limited because the routes would be reclaimed and revegetated to approximately their original topography as soon as they are no longer needed before the end of the life of the project. However, if any routes remain visible after reclamation, they could still be accessed by recreational users.

Project traffic may impact recreational users by causing delays, increasing the risk of traffic accidents, and accelerating road degradation. Meadow Bay is committed to using employee carpools to the project area to reduce traffic impacts, and would maintain county roads in good condition.

3.4.10.2.2 No Action Alternative

Under the No Action Alternative, the area would remain available for other multiple use activities, as approved by the BLM. Meadow Bay would continue to explore the project area under the approved Notice, which limits surface disturbance to a maximum of 5 acres. As a result, Meadow Bay would be able to create sequential acreage of disturbance with BLM approval. There would still be changes to recreational opportunities throughout the area, but impacts would be less due to the lower level of concurrent development.

3.4.11 Socioeconomics

The area used for analysis of socioeconomic impacts comprises Lincoln County.

3.4.11.1 Affected Environment

At the 2010 census, the population of Lincoln County was 5,345 (U.S. Census, 2013). Lincoln County is basically a rural area. The 2007-2011 American Community Survey 5-year estimate

of Lincoln County per capita income is \$18,298 (US Census, 2013). Employment by industry data within the same time period indicates that employment is primarily within educational services, health care and social assistance professions (23.9%); public administration (14.1%); professional, scientific and management, administrative and waste management services (10.2%); and agriculture, forestry, fishing and mining industries (9.8%) (US Census, 2013).

3.4.11.2 Environmental Consequences

3.4.11.2.1 Proposed Action

Under the Proposed Action, Meadow Bay would likely not have more than two rigs to complete the Proposed Action. All field crews would stay at the quarters onsite. With two rigs running, Meadow Bay would have three geologists, an expeditor and a camp cook, while the drilling contractor would have thirteen contract operators. The Proposed Action would provide 18 full-time jobs for about 9 months of each year for about two years. Most of these jobs would be for drillers or heavy equipment operators.

Because most of these jobs would be short-term jobs involving contractors, the addition of these jobs would not necessarily change the employment rate within Lincoln County. However, they would provide indirect beneficial impacts to the local economy through purchase and use of goods and services. According to research conducted at the University of Nevada at Reno, the mining industry directly employed 12,198 people in Nevada in 2008 and was responsible for another 52,000 jobs related to providing the goods and services needed by the industry and its employees within the state (Driesner and Coyner, 2008). Although this may not directly translate to a definite number of indirect jobs per mining job and may vary with respect to Lincoln County, it does provide some indication of how the addition of jobs in the mining industry would indirectly contribute to other employment sectors and therefore, communities in which those opportunities exist.

3.4.11.2.2 No Action Alternative

Under the No Action Alternative, Meadow Bay would continue to explore the project area under the approved Notice, which limits surface disturbance to a maximum of 5 acres at any one time. Meadow Bay's contribution to area employment opportunities within the mining industry and associated indirect impact to the local economy would remain at current levels.

3.4.12 Hazardous Materials

The analysis area for impacts to hazardous materials and fire and fuels management is the project area because it incorporates the areas in which there could be a hazardous materials spill or where workers could encounter existing environmental hazards.

3.4.12.1 Affected Environment

Recognized environmental conditions, for the purpose of the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) Superfund Amendments and Reauthorization Act of 1986 are defined by the American Society for Testing and Materials (ASTM) as "the presence or likely presence of any hazardous substance or petroleum products on a property under conditions that indicate an existing release, a past release, or a material threat of a release of any hazardous substances or petroleum products into structures on the property or into the ground, ground water, or surface water of the property" (ASTM 2005). The project area

and transportation routes do not include any current recognized environmental conditions. The project area has been used for previous mining operations. Meadow Bay has not conducted a formal Phase I environmental site assessment but has completed a very thorough internal site assessment for hazardous materials and health and safety risks.

3.4.12.2 Environmental Consequences

3.4.12.2.1 Proposed Action

The generation of waste and the use of hazardous materials to implement the Proposed Action could result in the accidental release of these wastes or materials during transportation, transfer, or use. The risk of contamination would be minimized through the application of the ACEPMs in Section 2.2.11.

Under the Proposed Action, the following hazardous materials would be delivered and used in the project area:

- Approximately 50 gallons of diesel fuel to be stored in vehicle and drill rig fuel delivery systems
- Approximately 50 gallons of gasoline to be stored in fuel delivery systems for light vehicles
- An aboveground diesel fuel tank of approximately 5,500 gallons, provided with its own double containment system, located at the quarters
- Approximately 25 pounds of lubricating grease, stored on the drill rigs or transported by drill trucks

Standard, nontoxic drilling muds and additives such as Floc 360™, Abandonite™, Alcomer 120L™, bentonite, EZ-mud™, Polyplus™, and Super Plug™ would be used for drilling activities and stored on-site. All containers of hazardous substances would be labeled and handled in accordance with regulations of the Nevada Department of Transportation (NDOT) and MSHA. No chemicals subject to the Superfund Amendments and Reauthorization Act and no extremely hazardous substances, as defined in 40 CFR 355, in threshold-planning quantities would be used in the project area or transported along the transportation routes.

The truck routes for delivery of hazardous materials to the project area and removal of trash and other wastes from the project area would be along Atlanta Road. Deliveries are expected to occur no more than once per week, with supplies coming from 37 miles away in Pioche. The transfer of fuel from the tank to trucks would occur primarily within the crew quarters; minor amounts of fuel transfer could also occur at each drill pad location. Maintenance of equipment would occur mainly at the quarters but could occur at any of the drill pad locations.

Self-contained, portable, chemical toilets supplied and serviced by a contractor would be used for human waste. All other refuse generated by the Proposed Action would be transported off-site and disposed of at an authorized landfill facility, consistent with applicable regulations. All human waste would be hauled off-site and disposed of in a sewage treatment facility. No refuse, human waste, or toilet chemicals would be buried on-site.

In the event hazardous or regulated materials were spilled, measures would be taken to control the spill and the BLM, NDEP, and/or the Emergency Response Hotline would be notified, as required. If any oil, hazardous material, or chemicals are spilled during operations, they would be cleaned up as soon as Meadow Bay becomes aware that a spill has occurred. After clean up, the

oil, hazardous material, or chemicals and any contaminated material would be removed from the site and disposed of at an approved disposal facility. Any hazardous materials uncovered during construction or exploration activities would be immediately reported to the BLM AO.

3.4.12.2.2 No Action Alternative

Under the No Action Alternative, Meadow Bay would continue to explore the project area under the approved Notice, which limits surface disturbance to a maximum of 5 acres. Solid and hazardous wastes would be present during those activities but would be in smaller quantities.

3.5 MITIGATION AND MONITORING

The ACEPMs described in the Proposed Action (Section 2.2.11) are sufficient to reduce impacts for all resources. Appropriate monitoring has been included in the Proposed Action. No additional monitoring is proposed based on the results of the impact analysis.

4.0 CUMULATIVE IMPACTS ANALYSIS

As required under NEPA and the regulations implementing NEPA, this section analyzes potential cumulative impacts from past, present, and reasonably foreseeable future actions combined with the Proposed Action within the area analyzed for impacts in Chapter 3 specific to the resources for which cumulative impacts may be anticipated. As defined in 40 CFR 1508.7 (Council on Environmental Quality [CEQ] regulations for implementing the NEPA) a cumulative impact is an impact on the environment that results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions, regardless of which agency (federal or nonfederal) or person undertakes such other actions.

4.1 ANALYSIS AREAS

Cumulative environmental impacts are most likely to arise when a relationship exists between a proposed activity and other projects expected to occur in a similar location, time period, and/or involving similar actions. Projects located in close proximity to the proposed exploratory drilling operations would be expected to have more potential for a relationship that could result in potential cumulative impacts than those more geographically separated.

The cumulative effect study area (CESA) for this EA is designated in Willow Creek Range, and adjacent Spring and Lake Valleys in Lincoln County (Figure 4-1). As shown in Figure 4-1, the northern limit is assumed to coincide with the Lincoln-White Pine county border and the southern limit is an arbitrary line through Pioche between U.S Highway 93 and the Nevada-Utah state line. The western limit is U.S. Highway 93 and the eastern limit is the Nevada-Utah state line. The total area of the CESA is approximately 900,000 acres. This site-specific EA tiers to, and incorporates by reference, the Ely Proposed Resource Management Plan/Final Environmental Impact Statement (BLM, 2007).

4.2 PAST ACTIONS

Atlanta Mine

Atlanta Mine was discovered in 1869 and included a historic underground and open pit gold and uranium mine located north of Pioche. Mining commenced in 1871 and continued intermittently until 1996 (BLM, 2007). Historic mining operations at the mine had resulted in an estimated 100 acres of surface disturbance. This disturbance has remained unclaimed.

Road Development

Roads built in the CESA prior to the 1990s largely accommodated mining operations and supplied local communities (BLM, 2007). Atlanta Road (County Road 894), County Road 322, Part of U.S. Highway 93 and many other unnamed small roads are located in the CESA. As shown in Figure 4-1, the total length of existing roads within the CESA is 1,659 miles with an estimated total surface disturbance of 4,508 acres.

Agricultural Development

Historic agricultural development in the CESA was generally associated with livestock and included irrigated pastures (BLM, 2007). However, it is hard to estimate the surface disturbance associated with agricultural development.

4.3 PRESENT ACTIONS

Exploratory Drilling Operations at Atlanta Mine

Meadow Bay is now exploring the project area under approved Notice, which limits surface disturbance to a maximum of 5 acres. Meadow Bay has drilled 21 bore holes on BLM land and 12 bore holes on private land at Atlanta Mine, resulting in approximately 7 acres of surface disturbance. Initial reclamation of the disturbed areas has been completed.

Agricultural Development

According to BLM's geographic information system database, there are lands under agricultural production for irrigated hay pastures, row crops, grain crops and orchards in the CESA (BLM, 2007). However, it is hard to estimate the surface disturbance associated with agricultural development.

Off-highway Vehicle Recreation Use

As large areas of BLM-administered land in Clark County are closed to OHV use due to measures taken to protect the desert tortoise and air quality, more recreation use has shifted to Lincoln and White Pine Counties (BLM, 2007). However, it is hard to estimate the surface disturbance associated with OHV use.

4.4 REASONABLY FORESEEABLE FUTURE ACTIONS

Lincoln County Conservation, Recreation and Development Act of 2004

The Lincoln County Conservation, Recreation and Development Act was signed into law on November 30, 2004. The act authorizes the sale of up to 9,000 acres of BLM-administered land in Lincoln County (BLM, 2007). The 0.5-mile wide LCCRDA utility corridor (see Figure 3-4) starts at Atlanta Mine. From U.S. Highway 93 eastward towards the eastern end at Atlanta Mine, the LCCRDA Corridor is 20 miles long within the CESA. If the 0.5-mile wide corridor within the CESA is all developed, the surface disturbance is estimated to be 6,400 acres.

Water Development in Lincoln and White Pine Counties

Groundwater development in Lincoln and White Pine Counties may occur. Proposals by the Southern Nevada Water Authority and Lincoln County Water District plan to install approximately 327 miles of buried pipelines, five pumping stations, six regulating tanks, one buried storage reservoir, one water treatment facility, approximately 341 miles of power lines with two primary electrical substations, five secondary substations, and four hydroelectric energy recovery facilities. The project would convey up to 200,000 acre-feet per year of groundwater from White Pine and Lincoln Counties to Clark County (U.S. Air Force, 2008). If combined 100 miles of water line and power line are developed with a 50-foot width within the CESA, the resulting surface disturbance would be 600 acres.

Wind Energy Project

The potential for wind energy development exists within the CESA. Table Mountain-Mount Wilson Wind is currently investigating wind energy projects in Wilson Creek Range. The surface disturbance associated with wind energy project may be at least 10 acres.

4.5 CUMULATIVE IMPACTS BY RESOURCE

Based on the information described in Sections 4.2 through 4.4, past, present and reasonably foreseeable surface disturbance is estimated to be approximately 11,630 acres in the CESA.

4.5.1 *Cultural Resources*

Cultural resources tend to degrade over time due to natural forces; however, many survive for hundreds or thousands of years. Any land-disturbing activity can disturb or damage cultural resources. Activities such as grazing, mining, exploration, and road construction all have the potential to affect the important associations between artifacts and features, disturb, damage, or cause changes to the setting of cultural resources, or otherwise adversely affect the resource such that its eligibility for inclusion on the National Register of Historic Places is affected. Impacts would depend on the amount, placement, and type of surface disturbance. Past and present development activities have led to collection of information about previous cultures, but also to the loss of sites. Identification and avoidance of NRPH-eligible sites through cultural surveys have reduced these disturbances but there may still be losses of cultural resources important to understanding the past. Recreation activities and wildfires may also cause damage or discovery of cultural resources. Cultural resources of concern within the CESA consist of prehistoric and historic mining resources.

The Proposed Action would disturb an additional 15 acres, which comprises approximately 0.13% addition to the past, present, and reasonably foreseeable surface disturbance. This contribution would be minimized due to implementation of ACEPMs and BMPs.

Total surface disturbance under the No Action alternative would be limited to five acres at one time, but could ultimately disturb the same amounts of surface disturbance as the Proposed Action and with similar impacts. This contribution would be also minimized due to implementation of ACEPMs and BMPs.

4.5.2 *Paleontological Resources*

Any land-disturbing activity (such as grazing, mining exploration, road construction) can cause surface and subsurface physical disturbance that could result in the destruction or discovery/recovery of paleontological resources. Impacts would depend on the amount, placement, and type of surface disturbance. Recreation and wildfires can also result in damage or discovery of paleontological resources.

The Proposed Action would disturb an additional 15 acres, an approximately 0.13% addition to past, present, and reasonably foreseeable surface disturbance. Implementation of ACEPMs and BMPs would be used to minimize impacts.

Total surface disturbance under the No Action Alternative would be limited to five acres at one time, but could ultimately disturb the same amount of surface disturbance as the Proposed Action and with similar impacts and distribution in geologic units that could contain recognizable fossil remains, vertebrate fossils, or scientifically significant nonvertebrate fossils. This contribution would be also minimized through implementation of ACEPMs and BMPs.

4.5.3 *Soil Resources*

Any land-disturbing activity that removes native vegetation and topsoil would adversely affect soil. Impacts would depend on the amount, placement, and type of surface disturbance, the type

of soil and its characteristics. Specific impacts to soils include removal of vegetation, exposure of soil, mixing of soil horizons (layers), soil compaction, loss of productivity, and increased susceptibility to wind and water erosion.

The Proposed Action would disturb an additional 15 acres of soils. This comprises an approximately 0.13% addition to the past, present, and reasonable foreseeable surface disturbance. This contribution would be localized and minimized due to implementation of ACEPMs and BMPs. Soil salvaged and used in reclamation would become viable and would be expected to return to pre-disturbance productivity once vegetation was established. Because earlier disturbances would undergo reclamation concurrent with later disturbances, it is expected that at least portions of the total 15 acres of disturbance would be reclaimed during the proposed project period, further reducing impacts to soils in terms of total cumulative acres of disturbance at one time.

Total surface disturbance under the No Action alternative would be limited to five acres at one time, but could ultimately disturb the same amounts of soils as the Proposed Action and with similar impacts. The No Action would also be partially or wholly reclaimed.

4.5.4 *Water Resources*

The Proposed Action would disturb up to 15 acres of vegetation, an approximately 0.13% addition to past, present, and reasonable foreseeable surface disturbance. BMPs and ACEPMs would be used to minimize erosion and sedimentation. Because earlier disturbances would undergo reclamation concurrent with later disturbances, it is expected that at least portions of the total 15 acres of disturbance would be reclaimed, further reducing impacts to water resources in terms of total cumulative acres of disturbance at one time. No groundwater impacts are expected from the Proposed Action as BMPs and ACEPMs would be implemented should groundwater be encountered during drilling operations.

Total surface disturbance under the No Action alternative would be limited to five acres at one time, but could ultimately disturb the same amounts as the Proposed Action. Similar BMPs and ACEPMs would be used to minimize erosion and sedimentation. The No Action would also be partially or wholly reclaimed.

4.5.5 *Vegetation Resources*

4.5.5.1 *Vegetation*

The Proposed Action would disturb an additional 15 acres of vegetation. This comprises an approximately 0.13% addition to past, present, and reasonable foreseeable surface disturbance. Because earlier disturbances would undergo reclamation concurrent with later disturbances, it is expected that at least portions of the total 15 acres of disturbance would be reclaimed during the proposed project period, further reducing impacts to vegetation resources in terms of total cumulative acres of disturbance at one time.

Total surface disturbance under the No Action alternative would be limited to five acres at one time, but could ultimately disturb the same amounts and types of vegetation as the Proposed Action, and with similar risks of limited reclamation. The No Action would also be partially or wholly reclaimed.

4.5.5.2 Noxious Weeds and Invasive Non-native Species

The project site currently is considered noxious weed free but has the invasive weed species, tumble mustard (Russian thistle) and cheatgrass, on the drill site especially in the previously disturbed area and along the access road. This condition exists throughout the CESA. The Weed Treatment Project implemented by the BLM Ely District inventories, treats and monitors noxious weed infestations to control their spread in the CESA. Any new infestations of noxious weeds, if they occur, would have cumulative effects on the nearby native plant community. However, new noxious weed infestations are not expected to occur due to the Weed Treatment Program that controls the spread of noxious and invasive plant species. Upon reclamation of these disturbed areas, the seeding could provide more diverse plant communities. By implementing the BMPs from the Ely RMP, the Proposed Action, in combination with other past, present, and reasonably foreseeable future actions, is not expected to result in new noxious weed infestations and non-native invasive species would be minimized.

4.5.6 *Wildlife Resources*

4.5.6.1 Wildlife

Impacts to wildlife from the Proposed Action consist of temporary impacts to 15 acres of existing wildlife habitat over a two-year period. This comprises an approximately 0.13% addition to the total past, present, and reasonable foreseeable surface disturbance identified above. However, the Proposed Action would be at least partially reclaimed during the proposed project period, thus the overall cumulative impact to wildlife would be reduced in terms of total acres of disturbance at one time.

Total surface disturbance under the No Action alternative would be limited to five acres at one time, but could ultimately disturb the same amounts and types of habitat as the Proposed Action.

4.5.6.2 Migratory Birds and Raptors

Impacts to migratory birds and their habitat from the Proposed Action would be limited to up to 15 acres removal of habitat, and noise associated with exploration. The Proposed Action would comprise an approximately 0.13% addition to the total past, present, and reasonably foreseeable future surface disturbance. These impacts would be further localized and minimized due to implementation of environmental protection measures and mitigation measures required by the BLM (e.g., migratory bird nest surveys during the nesting season to comply with the MBTA; ACEPMs to reduce equipment noise emissions). In addition, the Proposed Action would be at least partially reclaimed during the proposed project period, thus the overall cumulative impact to migratory birds and raptors would be further reduced in terms of total cumulative acres of disturbance at one time.

Total surface disturbance under the No Action alternative would be limited to five acres at one time, but could ultimately disturb the same amounts and types of habitat as the Proposed Action.

4.5.6.3 Special Status Species

Impacts to special status species from the Proposed Action would consist of the loss of up to 15 acres of vegetation. The Proposed Action would comprise an approximately 0.13% addition to the total past, present, and reasonable foreseeable surface disturbance. None of the surface disturbance is considered to be suitable for sage grouse, pygmy rabbit, Ferruginous hawk, Tunnel

Springs beardtongue or pink egg milkvetch. In addition, the Proposed Action would be at least partially reclaimed during the proposed project period, further reducing the cumulative impacts to special status species in terms of total cumulative acres of disturbance at one time.

Total surface disturbance under the No Action alternative would be limited to five acres at one time, but could ultimately disturb the same amounts and types of habitat as the Proposed Action.

4.5.7 Visual Resources

The Proposed Action would disturb up to 15 acres of vegetation, with resulting contrast with the form, line, color, and texture of the existing natural vegetation and topography throughout the area. This comprises an approximately 0.13% addition to the total past, present, and reasonable foreseeable surface disturbances identified above. The Proposed Action would be consistent with the BLM Class II and IV objectives. Visual impacts in the Project Area would be minimized to the extent possible; long-term visual impacts would be minimized upon completion of rehabilitation and reclamation. Because earlier disturbances would undergo reclamation concurrent with later disturbances, it is expected that at least portions of the total 15 acres of disturbance would be reclaimed during the proposed project period, further reducing impacts to visual resources in terms of total cumulative acres of disturbance at one time.

Total surface disturbance under the No Action alternative would be limited to five acres at one time, resulting in similar types but lower amounts of visual impacts as the Proposed Action.

4.5.8 Land Use

The Proposed Action (or No Action alternative) would not contribute to land use changes. As such, the Proposed Action (or No Action alternative) would not contribute land use impacts; and, therefore, would not result in a significant cumulative impact.

4.5.9 Land with Wilderness Characteristics

The Proposed Action would have a negligible temporary impact on an LWC in the project area. The Proposed Action (or No Action alternative) would not drive the unit below the size threshold. As such, the Proposed Action would not result in a significant cumulative impact.

4.5.10 Recreation

Impacts to recreation from the Proposed Action would consist of the loss of recreational access for portions of the 15 acres of proposed surface disturbance, as well as associated noise and visual disturbances. This comprises an approximately 0.13% addition to the total past, present, and reasonable foreseeable surface disturbance. However, the Proposed Action would be at least partially reclaimed during the proposed project period, further reducing the cumulative impacts to recreation in terms of total cumulative acres of disturbance and total vehicle trips at one time.

Impacts to recreation from the No Action alternative would be similar in type to the Proposed Action but recreational access loss and impacts from noise or visual disturbances would be limited to five acres of development at one time.

4.5.11 Socioeconomics

The Proposed Action would result in the creation of about 18 mining exploration jobs for approximately two years and represent the addition of a two-year opportunity for continued employment within the mining industry, continued contributions to the local economy,

potentially assisting in “smoothing out” the boom-bust cycle of mining development within Lincoln County.

Under the No Action Alternative, Meadow Bay’s contribution to employment and local economy would continue at existing levels (less than 10) for a longer time (e.g., 4-5 years).

4.5.12 Hazardous Materials

While hazardous materials would be used during the Proposed Action (or No Action alternative), risks would be reduced through implementation of ACEPMs identified in Section 2.2.11. Therefore, impacts associated with the Proposed Action (or No Action alternative) would not result in a significant cumulative impact.

5.0 CONSULTATION AND COORDINATION AND LIST OF PREPARERS

5.1 PERSONS, GROUPS, AND AGENCIES CONSULTED

The following table provides a summary of those persons, groups, or agencies consulted during preparation of this EA.

Table 5-1. Persons, Groups or Agencies Consulted During Preparation of the EA

Name	Purpose for Consultation or Coordination
U.S. Fish and Wildlife Service	Special Status Species
Indian Tribes	Native American Concerns

The BLM-Schell FO sent formal consultation letters on September 27, 2012, to the following tribes and tribal councils informing them of the proposed project and EA and inviting comments and concerns:

- Duckwater Shoshone Tribe
- Ely Shoshone Tribe
- Te-Moak Tribe of the Western Shoshone Indians of Nevada
- South Fork Band Council
- Elko Band Council
- Yomba Shoshone Tribe

No comments were received.

5.2 SUMMARY OF PUBLIC PARTICIPATION

As required under NEPA, the BLM solicited public comments on the Proposed Action. The BLM used comments received during the scoping period to determine the following:

- important issues to be addressed,
- possible data needs and sources,
- alternatives to be assessed, and
- potential effects of the alternatives on the human environment.

A public scoping letter was sent out on September 27, 2017, and comments were requested within 30 days of receipt of that letter. The mailing list can be found in the administrative record. Comments were received from the USFWS, requesting raptor surveys with a 2-mile buffer zone. No other comments were received.

5.3 LIST OF PREPARERS

The following tables identify BLM staff and consultants used in the preparation of the EA.

Table 5-2. BLM Staff Used in the Preparation of this EA

Name	Purpose for Consultation or Coordination	
Miles Kreidler	Project Lead/Minerals	
Mark D'Aversa	Air Quality, Water Quality, Floodplains and	

	Riparian/Wetlands	
Ken Vicencio	Range and Vegetative Resources	
Ben Noyes	Wild Horses & Burros	
Nancy Herms	Special Status Animals, Special Status Plants, Wildlife and Migratory Birds	
Renee Barlow and Jennifer Frederick McGuire	Cultural, Archaeological, Historical and Paleontological Resources	
Gus Malon	Wilderness Values, VRM and Recreation	
Cindy Longinetti	Lands-Disposal	
Brenda Linnell	Lands-All Others	
Melanie Peterson	Wastes, Hazardous & Solid	
Elvis Wall	Native American Religious Concerns and Tribal Coordination	
Solomon Odom	Environmental Justice and Environmental Coordinator/Land Use Planning	
Matt Rajala	Forest Resources and Fuels	
Erica Husse	ES & R	
Chris McVicars	Invasive, Non-Native Species	
Alicia Hankins	Land Law	
Emily Simpson	Wilderness Planner	

Table 5-3. Non-BLM Staff Used in the Preparation of this EA

Name	Purpose for Consultation or Coordination	
Derek Anderson, P.E., M.S.	Environmental Manager, Sunrise	Review of entire report
Jarom Hlebasko, GISP, B.S.	GIS Specialist, Sunrise	Preparation of some figures
Joseph Phillips, P.E., M.S.	Project Manager, Sunrise	Project coordination
Dao Yang, P.E., M.S.	Project Manager/Hydrogeologist, Sunrise	Preparation of entire report
Jill Hankins, B.S.	Biologist, JBR	Biologic survey
Greg Sharp, B.S.	Biologist, JBR	Biologic survey
Dale Gourley, B.A.	Principal Archaeologist, Bighorn,	Archaeological survey
Samira Hall, B.A.	Archaeologist, Bighorn	Archaeological survey
Robert Nash, B.A.	Archaeologist, Bighorn	Archaeological survey

6.0 REFERENCES AND ACRONYMS

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6.2 LIST OF ACRONYMS AND ABBREVIATIONS

amsl	above mean sea level
ACEPM	applicant-committed environmental protection measure
ASTM	American Society for Testing and Materials
AO	authorized officer
ATV	all-terrain vehicle
Bighorn	Bighorn Archaeological Consultants, LLC
BLM	Bureau of Land Management
BMP	best management practice
CESA	cumulative effect study area
CERCLA	Comprehensive Environmental Response, Compensation and Liability Act
CEQ	Council on Environmental Quality
CFR	Code of Federal Regulations
EA	environmental assessment
EIS	environmental impact statement
EPA	U.S. Environmental Protection Agency
ESA	U.S. Endangered Species Act
FLPMA	Federal Land Policy and Management Act
FO	field office
FONSI	Finding of No Significant Impact
ID	interdisciplinary
JBR	JBR Environmental Consultants, Inc.
KOP	key observation point
LCCRD	Lincoln County Conservation, Recreation and Development
LCCRDA	Lincoln County Conservation, Recreation and Development Act
MBTA	Migratory Bird Treaty Act
Meadow Bay	Meadow Bay Gold Corporation
MSDS	material safety data sheet
MSHA	Mine Safety and Health Administration
NAC	Nevada Administrative Code
NDEP	Nevada Department of Environmental Protection
NDOT	Nevada Department of Transportation

NDOW	Nevada Department of Wildlife
NDWR	Nevada Division of Water Resources
NEPA	National Environmental Policy Act
NNHP	Nevada Natural Heritage Program
Notice	Notice of Intent
NRCS	Natural Resources Conservation Service
NRHP	National Register of Historic Places
NRS	Nevada Revised Statutes
OHV	off-highway vehicle
PFYC	Potential Fossil Yield Classification
PoO	plan of operations
RC	reverse circulation
RMP	resource management plan
ROD	record of decision
ROW	right-of-way
SHPO	State Historic Preservation Officer
SOP	standard operating procedure
Sunrise	Sunrise Engineering, Inc.
USC	United States Code
USFS	U.S. Forest Service
USGS	U.S. Geological Survey
USFWS	U.S. Fish and Wildlife Service
VRM	Visual Resource Management

FIGURES

APPENDIX A:
BLM INTERDISCIPLINARY TEAM REVIEW RECORD

APPENDIX B:
Completed BLM Form 8400-4-Visual Contrast Rating Worksheets